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SIR D'ARCY WENTWORTH THOMPSON

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By The President

The Royal Scottish Geographical Society has to record the deep sense of the loss sustained by the death of the late President, which took place at St. Andrews on 21st June 1948, and ended a remarkable life of over eighty-eight years. So has passed a great figure in Scottish academic and scientific life. But Sir D'Arcy's notable gifts and personality were appreciated far beyond Scotland; indeed he had friends among the scientists of many nations and was a specially welcome member of national and international congresses throughout his life. His friendships among young people delighted him during his long career as a Professor—at University College, Dundee, from 1884 (Biology), and at St. Andrews from 1917 (Natural History).

His gifts as a biologist were recognised by his election as a Fellow of the Royal Society in 1916 and as a Vice-President in 1931. He was President of the Royal Society of Edinburgh from 1934 to 1939. From his early contact, as a student in Edinburgh, with Sir Wyville Thomson onwards, his scientific interests were largely related to the sea, and his contributions to marine biology began early. He was made a C.B. in 1898 for his service on the British-American enquiry into the fur-seal industry in the Bering Sea, the result of which saved this valuable animal from extinction. Ever since, his knowledge was indispensable where problems of sea-fisheries were under discussion, and for his services on the Fishery Board for Scotland—and for other good reasons—he was knighted in 1937. Sir D'Arcy presided at a Committee of this Society in 1945 to consider how the study of oceanography might be revived in Scotland.

Sir D'Arcy Thompson was a Doctor of Letters and a noted classical scholar; he was also a competent mathematician, and was able to show, for example, how the form of the Great Pyramid was related to the processes of its construction. Without describing more fully the many facets of his intellect which gave lustre to his great reputation as a man of learning, emphasis must be given to his general attitude to scholarship. By this he offered a much-needed corrective to the effects

of ever-growing specialisation, and he upheld vigorously the aims of true culture.

It is doubtless for this reason that this Society was not disappointed when it invited him to accept the Presidency in his eighty-second year. For he understood clearly that the function of geography is that of co-ordination, of providing the pieces which too often go amissing when only specialised investigations are made. He appreciated the essential part of geography in achieving a complete understanding of terrestrial environment. And so, having accepted the Chair in 1942, our late President characteristically devoted himself to the duties, despite no little inconvenience, and discharged them for four years with marked distinction and charm.

These services are recalled with gratitude.

SOME MICRO-CLIMATICAL ASPECTS OF THE ABERDEEN AREA

By G. K. Townshend

Of recent years, with the closer geographical study of individual areas, it has been increasingly recognised that a broad view of climate is sometimes insufficient, since detailed observation has shown that weather conditions vary, often quite surprisingly, within a relatively small distance. Though average conditions obviously retain prime importance, more attention is now given to local variation in climate, and this new aspect of the subject is in process of development as the science of micro-climatology.[1] Most work has been done on the Continent of Europe, and, although a small number of studies of conditions in England has been completed, little would seem to have been done so far in Scotland.[2]

Temperature conditions probably best lend themselves to detailed observation, and the significance of low-temperature contrasts—*i.e.* in leading to frost pockets in low-lying ground—has long been recognised. Another effect which is particularly important in coastal regions—that of local temperature variations in inducing fog and mist from the sea—has been much less studied. It is interesting to note, in this connection, that at Aberdeen, after a hot, windless period, during which time evaporation is great, mist and fog are very easily formed when a cooler wind blows off the sea. This was clearly demonstrated during the summer in 1947. Frequently during the hot summer days a slight onshore breeze would form a line of fog, which, although completely obscuring the coastline, rarely penetrated more than half a mile inland. Often a point 100 yards from the sea would be in hot sunshine, the beach itself being obscured by the cold mist.

Urban Climates

It has been demonstrated by study in cities on the Continent and in the U.S.A. that with calm, cloudless conditions a "heat island" is formed in the centre of a built-up area. The causes would seem to be threefold: first, interference offered by buildings to incoming cold currents, which would tend to disperse the heat island; second, the preponderance of good heat retainers and absorbers, such as dark roofs and roads; third, the reduced rôle of evaporation as a cooling agent. In a large built-up area, situated on low-lying ground, the heat island may overcome katabatic inversion of temperature. These conclusions have been well supported by surveys carried out in the Aberdeen area.

On 11th March, 1948, after a warm day, a nine-mile traverse through the city, from the open country to open country, was taken between 9 and 10 p.m. (see Fig. 1 a). Conditions were very favourable for radiation, as there was little wind or cloud.[3]

A heat island was found within the built-up area. Katabatic inversion was seen for the first half-mile, where over a descent of 150 feet the temperature fell nearly 3° F.[4] This temperature was soon overcome by the heat of the city, and temperatures began to rise steadily, until at points C and D, in the centre of the city, temperatures rose to 44°, an increase of 5 degrees.

Beyond the centre of the city cooler air was encountered, and, on leaving the built-up area, temperatures fell sharply. At the foot of Tyrebagger Hill (point G) the minimum of 35° was recorded—*i.e.* 9 degrees lower than at the city centre. Temperatures again increased up the hill, and at the top, 500 feet above sea-level, a temperature of 43° was recorded. It is possible that the woods around the Tyrebagger Hill area had a modifying influence on the radiation, but nevertheless, half-way up the hill, before any trees were reached, the temperature had risen nearly 5 degrees. In studying the graph certain anomalies are seen, but these can be explained. At point A (Wellington Bridge) a high temperature of 42·3° was recorded. This might be attributed to the proximity of the River Dee, which could be expected to exert a modifying influence on the temperature, water having a higher specific heat than the surrounding areas. On the other hand, a lower temperature of 41·6° was recorded at point B, which is situated in relatively low-lying ground. The low temperature was probably produced by a katabatic inversion within the heat island itself, the constant temperature of the heat island being lowered by the inflowing of cold air. This feature is even better seen at point E, which is a road junction situated in what would appear to be an air trap. Cold air flowing downhill from the north and north-west along broad main roads has no outlet farther downhill to the south and south-east as the road becomes narrow and winding, producing in effect a complete block by buildings. Thus a cold pocket of air at a temperature of 39° was recorded.

It will also be seen that the heat island appears to extend outside the built-up area at Woodside (F). This may be due to one or both

of two things. Owing to the slight south wind, the hot air may have drifted slightly northwards, or else the proximity of the River Don may have had some control on the temperature of the area.

A further traverse made on 28th January, 1948, revealed that the centre of the city was warmer than the surrounding country. At Woodend, Stockethill, and Rosehill, on the outskirts of the city, the temperature was a little over 39°, whereas in the centre of the city the

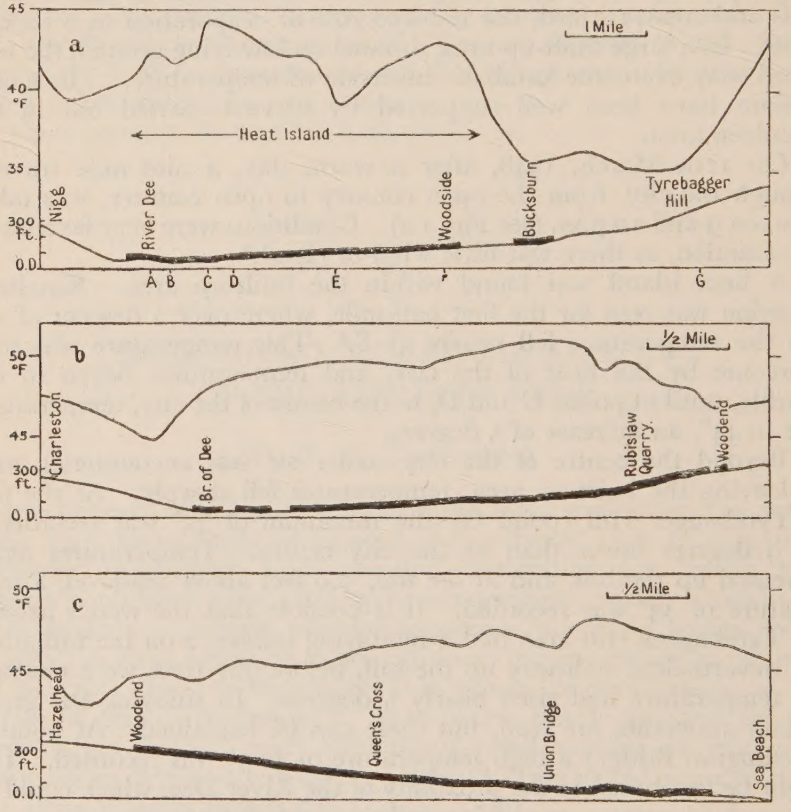


Fig. 1. Traverse across Aberdeen. (a) March 11, 1948, 9-10 p.m. G.M.T. (b) May 16, 1948, 10 p.m. B.S.T. (c) May 29, 1948, 11 p.m. B.S.T. Thickened portion of profile represents built-up areas.

average temperature was a little below 42°, and at Marischal College it reached 43°.

On 16th May, 1948, another traverse was taken, first from the south side of the city, and then, before reaching the actual centre, diverging westwards. Though the centre of the city was not touched, again the presence of a heat island, counteracting the natural inversion, was obvious, and the centre of the built-up area was seen to be 4 to 5 degrees warmer than the surrounding country (Fig. 1 b).

On 29th May, 1948, at 11 p.m. a traverse was taken from Hazlehead, west of Aberdeen, eastwards down to the sea (Fig. 1 c). Notable features were the presence of a heat island and a rapid cooling from the

city centre to the sea. Supplementary readings which were taken at 4 points along the traverse, each 50 feet downhill to the south, showed inversion within the heat island. All four supplementary points were 1·5° to 2° colder than corresponding points on the straight traverse. This traverse also demonstrated that the phenomena are not confined

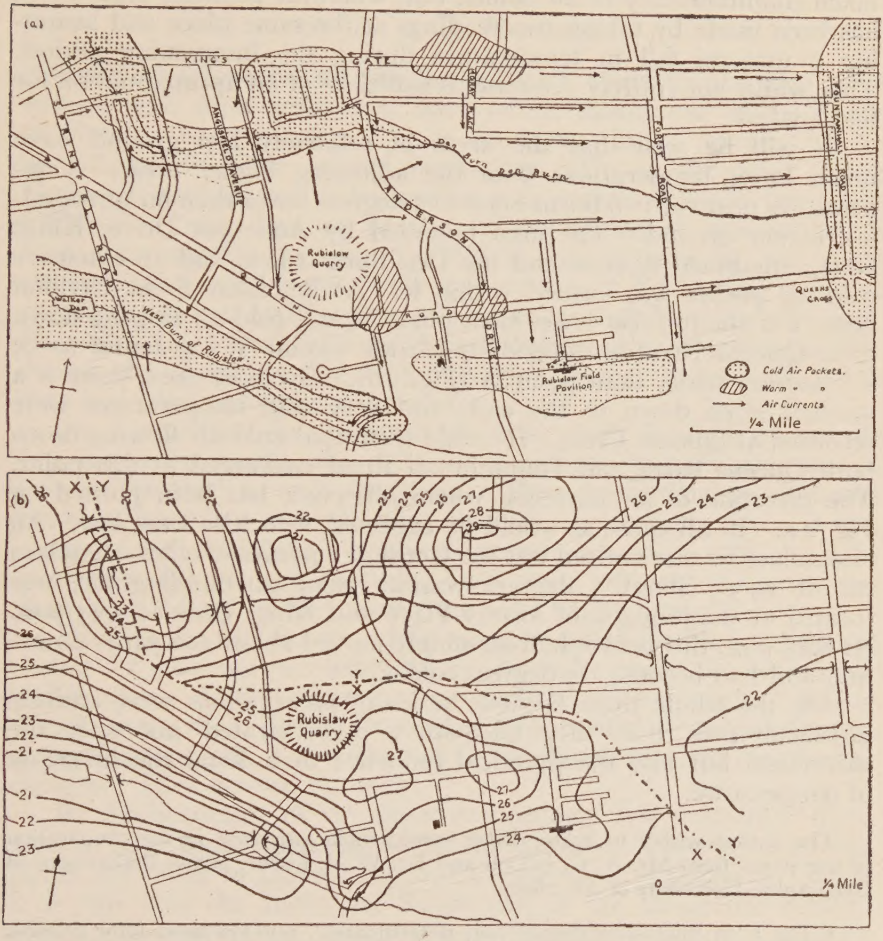


Fig. 2. Local temperature conditions, western district of Aberdeen. (a) Summary of temperatures and air flow, evenings of December 1 and 3, 1947. (b) Surface isotherms (°F.) at 7 p.m. G.M.T. Area marked X—surveyed December 1, 1947. Area marked Y—surveyed December 3, 1947.

to the winter months of the year, or to days with a clear sky, as there was a considerable cloud cover (9-10/10).

On 1st and 3rd December, 1947, two series of readings were taken in the Rubislaw area of Aberdeen (Fig. 2 a and b). On both occasions there was a clear sky with a very slight north wind. Temperatures were about 8 degrees below freezing point, and it was possible to observe the formation and movements of pockets of cold and, in some

cases, relatively warm air. It is significant that cold air pockets were forming exclusively in the low-lying areas. The main trend of relief —two shallow valleys defined by low ridges that are occupied respectively by Kings Gate and Queens Road—is sufficiently indicated on the map by the two open burns. Temperatures could not be taken simultaneously at all points, but, wherever possible, adjustment has been made by taking two readings at the same place and assuming a uniform fall in temperature during the intervening period. This, whilst not entirely accurate, is sufficient of an approximation for first analysis.

It will be seen that the areas of relatively low ground have much lower temperatures than the adjoining higher areas. Temperatures near the two burns are 2 to 5 degrees lower than on surrounding higher ground. The area bounded by Anderson Drive, Kings Gate, Angusfield Avenue and the Den Burn is low, and an extensive cold air pocket was formed within it. At Rubislaw Field Pavilion point Y is about 7 feet lower than point X, and cold air flowing down from Queens Road is stopped by a wall. Point Y was found to be 1·7 degrees colder than point X (Fig. 2b). Over the area, there is a gradual slope down to the east, and very cold temperatures were recorded at Queens Cross. It would seem that cold air flowing down both Queens Road and Fountainhall Road converged at this point. The direction of air currents, where observed, has been plotted on Fig. 2 a. In all cases, as would be expected, velocities were low. An anomalous feature noticed was the fact that a pocket of relatively warm air at 29·3°, about 5 degrees warmer than surrounding air, was located at the junction of Moray Place and Kings Gate at 7.35 p.m. At 8.25 p.m. this pocket had seemingly moved about 100 yards downhill, and had become 1·5 degrees colder.

On the whole these last two series of observations were entirely satisfactory, in that they adequately demonstrated not only the theoretical but also the practical influence of a katabatic inversion of temperature.

The author wishes to acknowledge considerable assistance in the preparation of this paper from Mr. A. C. O'Dell and Dr. W. B. Fisher, of the Department of Geography, University of Aberdeen.

[1] The term micro-climatology has, unfortunately, not yet been fully defined, and is used either with reference to local variations in the climate of a particular area, or, alternatively, referring to extremely small variations—for example, as between vegetation and the air immediately above. Here it is used in the former sense, following the usage in most existing literature (cf. HAURWITZ and AUSTIN, "Climatology," 1944).

[2] Two papers, however, may be mentioned: M. T. SPENCE, "Temperature Changes over Short Distances as Shown by Records in the Edinburgh District," *Q. Journ. R. Met. Soc.*, 1936, Vol. 62, p. 25; and J. PATON, "Temperatures and Air Flow within a Wheatfield (S.E. Perthshire)," *Weather*, 1948, Vol. 3, No. 1, p. 22.

[3] It would have been desirable to quote the temperature of the Aberdeen district as given in the daily Weather Report. Unfortunately, however, since the closing of the Air Ministry Meteorological Observatory at King's College, Aberdeen, the nearest figure available refers to Dyce Airport, situated some six miles to the north of the city.

[4] All subsequent temperatures given are in degrees Fahrenheit.

TRANSHUMANCE IN SOUTHERN NORWAY

By D. E. H. Hayward

Against a background of infertile land, short summers and long, dark winters with their permanent snow cover, inhabitants of the South of Norway have contrived, since Neolithic times,[1] to practise an agriculture involving animal husbandry. Up to the time of the Germanic migrations, valley settlements appear to have been self-sufficient. From then on, pressure of population on the unforested land grew steadily, and by the Viking age, in spite of large-scale clearing of forested areas, daily movements of flocks and herds to detached pastures had become a necessary part of the valley economy. Necessary, since what little arable land there might be had to provide during the short growing season crops sufficient to maintain both man and beast throughout the winter.

As competition for pastureland grew, and the fells above the tree line were sought, the daily cycle became impracticable and a seasonal migration took its place. Thus transhumance probably became customary soon after the close of the ninth century. It was certainly well established by the thirteenth, when, in 1263, the Old Norwegian Statute, the Gulathing Law, made reference to its customs, describing them " as they have been since olden times."

Exile to the fells for the whole summer called for the provision of shelter for men and protection for the animals against the bear, wolf, and glutton. At first many farmers used the old hunting and fishing huts,[2] where these already existed. Adjustments to suit their new purpose were made, and enclosures for the beasts at night constructed outside. Thus evolved the *seter*.

By the beginning of the nineteenth century, it is estimated,[3] there were at least 60,000 seters in use in the country. A century later this figure had fallen to 44,000 in spite of the increased population. While it is true that the Industrial Revolution of the nineteenth century affected Norway much less drastically than most western European nations, the indirect effect of mass production *elsewhere* has made itself felt since 1860, when the importation of American wheat meal began. The farmer has been changing his economy from one of virtual self-sufficiency to one of absolute dependence on foreign commodities, especially foodstuffs. Transhumance, without which he could not have existed before, has now lost its significance, and its practice is apparently on the decline. Though if conditions in Telemark and in the Hallingdal and Gudbrandsdal areas are at all indicative of contemporary trends, it would seem that there is now no likelihood of this decline leading to an extinction, such as has all but occurred in Britain, where transhumant movements, barely recognisable on the mainland—for instance, in Wales [4]—remain in a true form only in the Outer Hebrides.

The Seters

In Vestfjordal and Hallingdal—and, to a lesser extent, in Gudbrandsdal—the valley sides are for the most part without buildings until they begin to flatten out into the plateaux above. Here, in clearings beside streams or tarns, the first seters may appear, but the main belt is not met until the conifers thin out and the hardier birch begins to predominate. Where the mass of timber trees dwindles into a scattering of dwarfs—" The Forest Line "—lies the real seter belt. This is no accident. Two important factors in the choice of seter sites have been the supply of building material and of fuel. Since heavy material is not easily moved over this terrain, construction tends to take place at the source of supply, and then the processes of cheese-making demand almost continual boiling out, on fires for which the fuel must be wood where time and labour are insufficient to exploit the possibilities of peat beds. A third factor in the choice has been the supply of fresh water, as important to the dairying as to the immediate human and animal needs. *Thus the coincidence of forest line with stream or lake has become the ideal seter position.*

Other factors, such as insolation, have apparently been of subsidiary importance in the choosing of sites. A tendency to make the most of any favourable slope was indeed noticeable in Telemark, where seters lying on a north-facing incline often made use of a small reverse slope (" Secondary Adret "). But, in contrast to the steep-sided peaks and the deep valleys, insolation over the whole stretch of the fjells, especially the flat stretches of heathland pasture—the " vidder " —is high, and any small variations are of relatively little importance where there is no intensive cultivation. Hay could benefit from a greater interest in the importance of exposure to sunlight, and many, especially the founders of the many new seters built in the seventeenth century, and still known as " nyseter," have probably realised this ; but where opposed by considerations of wood and water supply, the advantages of Adret positions can never have been a deciding factor.

Between the forest and the climatic snow line lie the rough pasture lands owned by the valley " bygder "—small rural districts—or by individual farmers. Though in valleys such as Vestfjordal, where farms visited received no direct sunlight between September and March, the acute angle of the confining slopes limits exposure to the sun's rays even in the summer months, up on these pastures the full effect is felt as soon as the ground is uncovered. It would seem that the long daily duration of direct sunlight[5] falling on recently saturated ground is the main factor responsible for the noticeably rapid plant growth in a soil not naturally fertile. The vegetation though coarse is well developed. Berried plants such as the cowberry (*Vaccinium vitis-idaea*), bilberry, and the luscious cloudberry (*Rubus chamaemorus*) abound.

Originally merely a primitive dwelling hut, the seter has come to be something more complex. The improved construction includes with the dwelling an annex, where cheese-making is carried on, and a store for milk and products. Set apart is the byre, a shelter for the

milk animals, often combined with a hay-loft and comparable to the alpine " fenil." The valuable manure, to be spread over the clearing before descent in the autumn, is usually collected below the raised floor of the building and is thus protected from undue leaching.

The buildings are of timber, strongly constructed for the most part ; though the annex may be of less stout material, often unjointed planking. Traditionally the roof of the " sel," or dwelling proper, and usually of the byre, is of birch overlaid with turf sods. This may become overgrown with grasses, and even flowers and shrubs, giving a colourful and picturesque appearance. This result is, however, incidental, the material being chosen on its purely utilitarian merits. Turf and birch are convenient local materials, giving protection and

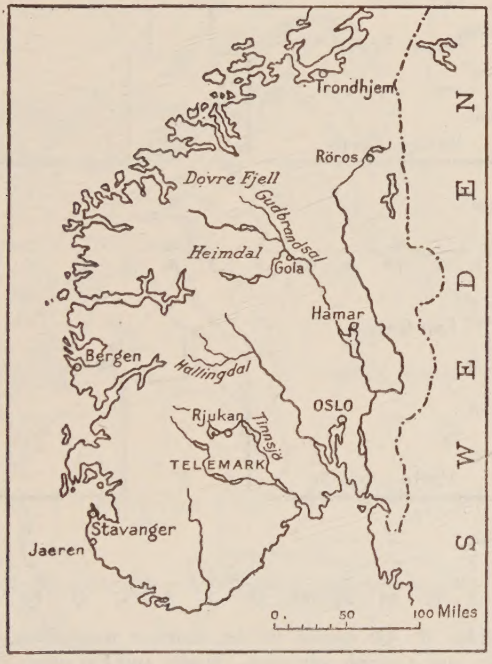


Fig. 1. Southern Norway.

heat insulation, and involving no transport problem. The annex, in keeping with its less robust walls, is to-day only too often roofed with the less sightly corrugated iron sheeting or light planking which demand less skill and time in replacing.

In the areas visited, the dairy store was invariably found to be built on to the north of the main building. This appears to be the rule whether the store forms part of the main construction or is a projection from it. It must be one of the very rare examples of the sun-conscious Norwegians deliberately planning to avoid sun rays !

As regards the move from farm to seter, local customs vary from valley to valley, and no attempt can be made here to describe each in turn. What follows, though perhaps most typical of Telemark, is applicable to the greater part of the regions visited.

Most valley bottoms will be clear of snow by May, and though seters are not in use before the middle of June, where there are large flocks of sheep these may leave the farms in May. A shepherd collects animals from several farms and accompanies a flock of two hundred or so to the heights, where the snow still lies in patches. The seters are passed by and the sheep taken far above and beyond the tree line, where the only shelters are the shepherds' huts—simple stone shelters stocked with last year's ham and cheese, and little else.

June 24, St. John's Day, is the day when the ascent to the seters begins throughout the country. Since Midsummer Day was a heathen

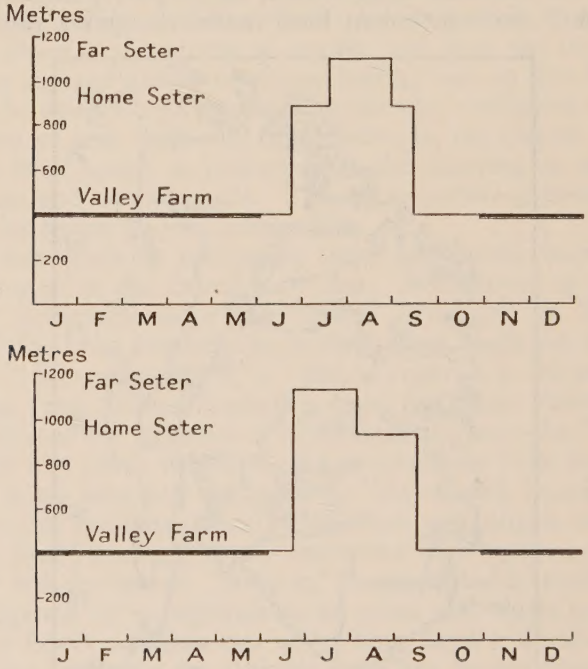


Fig. 2. Examples of the course of the summer migrations: Customary pattern and a simple variation. Home and Far seters are not necessarily always at different heights. Thickened line: period of stabulation.

festival, and since Christianity later substituted a Saint's Day, the choice is no doubt one of convenience, made in the days when printed calendars were unknown, and has probably been customary since transhumance was first practised. It appears to bear no direct relation to climatic or vegetational considerations.

Cattle, and especially milk cows, are the important element in the procession which leaves the farm; but goats, pigs and, where they have not all left previously under a shepherd, sheep may accompany them. The farmer either owns or shares a *pair* of seters; one perhaps a day's slow march—with animals over rough ground—farther from the farm than the other. They are known as the "far seter" and "home seter." The procession halts first at the home seter, where

grazing starts on the rough pasture outside the clearing. The dairymaid and her charges remain at the home seter while the hay is cut both there and at the far seter. Once this is done, and the best of the "home" pasture has been grazed, she is free to move to the other seter, which she usually does about the middle of July. The far seter is abandoned in the first days of September and a return made to the nearer one, en route for the valley. This second halt at the home seter is short, but the best is made of newly grown pasture before the descent on 14th September, the day of the Holy Cross.

A more simple procedure is common in some parts, where the

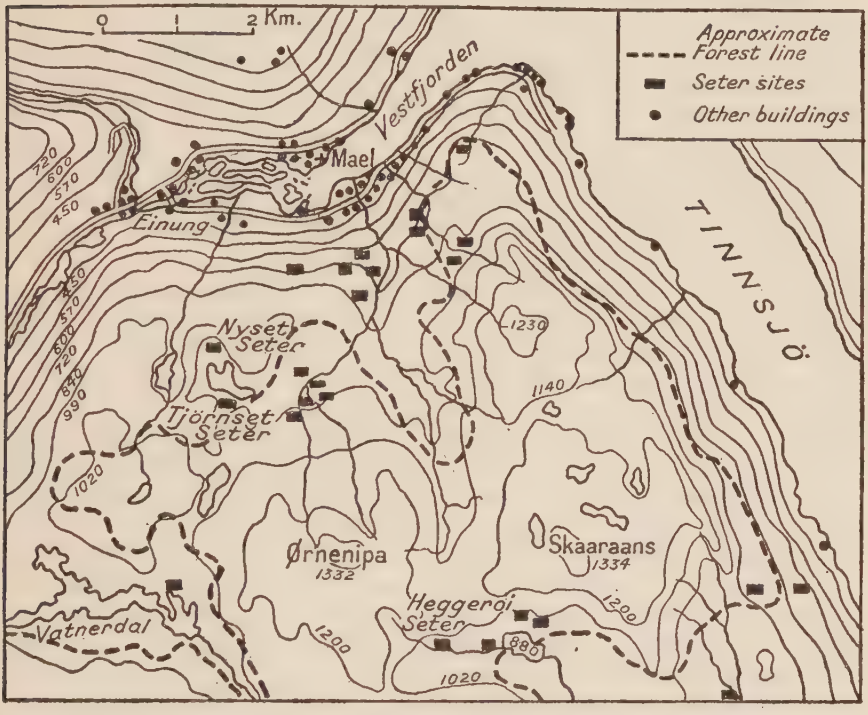


Fig. 3. Seter country where traditional systems remain, at Tinnsjöen. Heights in metres. *Einung*: a farm. *Nyset Seter*: home seter. *Heggeroi*: far seter.

ascent in the first place is direct to the farther seter. In this case a move to the home seter is made about 10th August, and descent to the valley again on 14th September. In the diagram (Fig. 2) and the sketch map (Fig. 3) an attempt has been made to clarify the above.

Any sheep on the seter pastures are allowed to roam at will, and may call for no more care on the part of the dairymaid than a casual long range check on their wanderings. She has some cause for anxiety, however, as it is usual to lose one out of every twenty each season, through accidents such as falls. This loss represents the expected casualties, and she may lose many more on occasions to the glutton, which, as the name would seem to suggest, kills wantonly and on some scale.

Unlike the sheep, goats are kept close to the seter buildings, or are herded with the cows. They are essentially milk animals and provide a considerable part of the dairy needs. Buck goats, unlike the rams, may be found up at the seter, as kids are not bred to suit a market as are lambs.

Pigs are not inevitably brought up to the fjells, but when present they remain near the buildings and are fattened on by-products, such as whey, from the dairy annex.

The cattle are driven out on to the rough pastures early in the day, and may be watched by a child, though once on the chosen area they are frequently left to return on their own in the evening. They are milked in the byre where they remain for the night.

Most of the milk is converted into butter and pure or blended cheeses. Where the number of goats is sufficiently high, pure goat cheese is made, and this secures the highest prices. Fuel supply may control the type of cheese produced, for where fuel is short, sour cheeses, which require no boiling out, are substituted for the more usual sweet types. At week-ends, visitors from the home farms bring fresh food supplies and take away butter for the farm or market. The cheese, which is not so perishable, remains until the final descent.

As labour is now short, it is seldom that more than one crop of hay is gathered from the fjells in a season, and one seter clearing of a pair may have to be grazed over. What is not immediately carried down to the valley is stored in the byre loft, where it may remain until the first snows make transport by sledge possible.

So acute is the fodder situation even to-day in isolated parts of the country that hay is often supplemented by birch leaves and, to a greater extent, by moss. The best moss is raked from the lower grassy slopes in the autumn and fed relatively fresh to the animals at the beginning of stabulation. The types most commonly in use seem to be a club-moss (*Lycopodium clavatum*), reindeer moss, and a moss difficult to classify but known in the Vestfjordal area as Brødmose (bread moss). Gathering has to be limited in extent, as many varieties take twenty or more years to recover from each harvest.

In the valley, the main crops are gathered in before mid-September when the animals return from the seter to graze on the stubble fields. The sheep are the last to leave the fields in October, and stabulation is general by 1st November.

The Setergrend and Seterlag

Alongside the traditional transhumance, newer practices have grown. The two most obvious are seter systems, based no longer on the isolated seter but on a group of seters.

The group may be of natural growth, the result of the use of common pastureland, or perhaps of some convenient road. In the plain "setergrend," each seter is run independently of the others, but transport of milk to the valley dairy may be shared. Up to the present, these have been more numerous than the "seterlags"—a word commonly used to indicate a "grend" or group of seters owned by

a "lag" or company [6]—where co-operation is complete; capital, profits, labour, equipment, and transport facilities are all shared. Each type of group serves a dairy in the valley which is usually run on a co-operative basis, and in the case of the seterlag is under common ownership with it. Products, such as cheese and butter, normally become a dairy responsibility. In these respects the newer systems are quite distinct from the old. In many others, the dates of ascent and descent, for instance, there is no break with tradition.

Industrialisation, far from threatening these systems, actually does much to encourage them. The effects of the advent of industry to a highland area are evident to-day in the case of Vestfjordal in Telemark. Here, since the construction of hydro-electric and associated plants at Vemork, and of the nitrate works at Rjukan, the owners of isolated

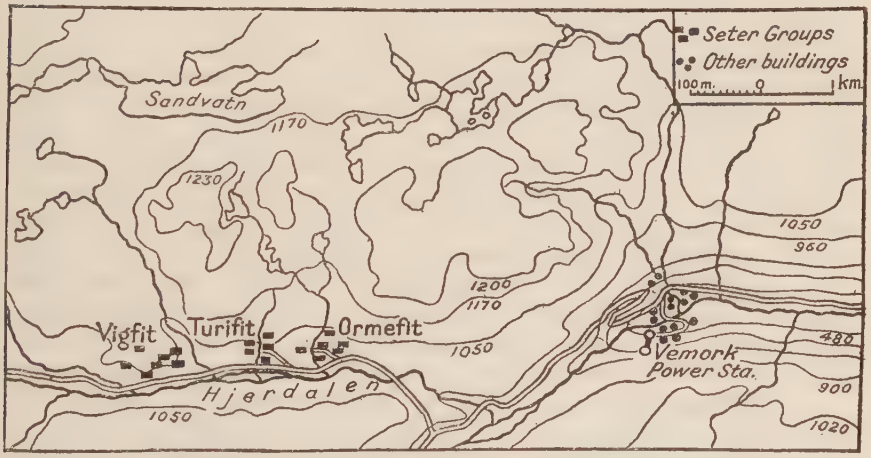


Fig. 4. Telemark: Seter groups serving the Rjukan dairies; Vemork power station. Heights in metres.

seters have continued to struggle vainly to maintain the full vigour of their form of transhumance.

While the valley as a whole, and the town in particular, have prospered, the tell-tale number of abandoned seter buildings grows almost yearly. Yet transhumance in its modern guise is very much alive in Vestfjordal to-day. Dairies have more than shared in the valley's prosperity, and since extensive lowland pastures are not a feature of this region, these dairies must be supplied, in part at least, from fjell sources in the summer. Seter groups, such as those shown in the sketch map (Fig. 4), have exploited the position fully; and though the "lags," more common further north, are not a feature of this region, any "grend" investigated was in a particularly flourishing condition.

An Equine Migration

The seter systems conform closely to the accepted pattern of Alpine transhumance, and their counterparts are to be found elsewhere in Europe. Another practice has developed, however, falling within

the wider interpretations of transhumance, to which something comparable may be found in Hungary, but which is in detail peculiar to Norway.[7]

In the latter half of the nineteenth century the Norwegian Government sponsored horse-breeding schemes involving the controlled summer pasturing of horses on the higher fjells. In an agricultural country, where the possibilities of mechanical haulage are limited by the terrain, it is not perhaps surprising to note that, even in the twentieth century, the number of horses in the country has continued to rise.

The State intends to maintain the high qualities of the two main native breeds and particularly of the "Østland," and the scheme aims at giving this policy as wide an application as possible while ensuring that none of the natural hardiness is lost by applying artificial conditions.

In the middle of June an annual selection of prize-winning stallions from various districts is collected and sent to State-owned highland areas lying between 3000 and 7000 feet. Each stallion is allotted his area and is accompanied there by a "harem" of some forty to fifty mares taken yearly from a fresh selection at private farms. A nominal sum is paid by the farmers for each mare accepted. From the middle of June to the end of August the stallions remain in command of their harems, each is free to roam over an area of perhaps 30 or 40 square miles. So absolute is their authority at this time that unfortunate mares who fail to please them are frequently found returning alone, and obviously in disgrace, down the valley paths. Since they are at their most receptive to re-impregnation soon after foaling, mares may join the harems in foal and give birth alone and unattended. The vulnerability of the group in these circumstances is apparently sensed by the stallions, who, on the slightest provocation, will form their mares, heads inwards, into a circle presenting a formidable battery of rear hoofs to an attacker. Danger of attack is seldom real, however, as, in the mass, horses are not prey to the Norwegian carnivores. A check on the positions of the group is kept by centrally positioned observers, working from huts of the Alpine "remue" type. These men are the only local human element involved, though there are, besides, visiting veterinary inspectors covering the areas by continual tour.

At the end of August, horses led down from the fjells are sleek and in perfect condition. Mares return to their owners' farms. Stallions are put out to private "hosts"—*i.e.* farmers who care for them in return for the work they will do, and the gift of the animals when past their prime. Here again the effort to ensure breeding of sound working horses is evident—both stallions and mares invariably work in harness when not on the mountain pastures.

Conclusions

For a century throughout Europe the practice of transhumance has been on the decline, and the old seter system of Norway has been no exception. Apart from the virtual disappearance of such

phenomena as the winter seters,[8] a legacy from the seventeenth-century boom, the normal characteristic Norwegian seter practices are playing a less prominent part in the life of the country.

The drop in the number of seters in use from about 44,000 in 1907 to 30,000 in 1939 was steady, and there is no reason to believe that the unnatural revival between 1940 and 1945 is more than a very temporary check in the decline begun in the middle of the last century. The drop, however, cannot be taken to mean a corresponding fall in the number of farmers practising transhumance, as to-day many use one seter instead of a pair, and yet more share in the use of seters not necessarily their own. But it is impossible to escape the conclusion that the vigour with which the practice was carried on formerly is lacking to-day. Necessity is no longer the spur it was, and the lack of labour provides valid excuse for the apparent casualness so noticeable in the old seter areas, where hay is left uncut in the less accessible places, manure is left to waste away unused, moss is seldom thought worth the labour of collection, and more and more live-stock remain at the farms throughout the year, and are often stall-fed beyond the necessary period of stabulation.

The dependence of the new economies on the importation was well illustrated by the marked resuscitation of the old seter customs during the German occupation. Statistical evidence is unobtainable, but among Norwegian farmers the fact of the revival is regarded as common knowledge.

The change in the pastoral industry has been based on exploitation of the facts of imported foodstuffs and wool and of large urban populations divorced from agriculture. The sheep farmer has found that mutton pays him better than wool ; and, while fjell pastures appear to improve fleece, it is stall feeding and concentrated foods which increase the flesh. The cattle farmer has concentrated on milk production, and milk cows on the fjells are inconvenient to the dairies.

The railways and improved roads have not only facilitated the spread of the effect of imports, but their construction and maintenance has drained labour from agriculture and pastoral pursuits. Hydro-electric plants and isolated engineering schemes have intensified the more recent sapping of labour from the land, the main cause of which has been the higher wages and other attractions of the towns.

The areas first affected by the new conditions were those lying near to the large towns, and particularly the more accessible of them. Østfold, Vestfold and Akershus were the first to suffer. In Østfold 150 seters remained in use up to the end of the last century. To-day all these are deserted. Town life has offered liberation to the many who formerly resented the virtual incarceration by farm winters, and yet were unwilling to go to the length of the only alternative—emigration overseas.

Yet, in discussing the social aspect, it must be stressed that there is, among some sections of the population, a distinct regret at the passing of a custom which has played a part in the lives of so many. The regret is not confined to those who intellectually deplore the fading of national customs and folklore as such, nor to the sophisticated summer

visitors from the towns, but is most strong in the small farmer directly involved. Even though there may be no economic justification for the retention of a seter, he will often continue to maintain one for domestic reasons alone. It has been customary for his family, as a whole or in part, to go up to the fjells during the summer. To children living in deep, sun-starved valley floors, the seter time has always been something of an adventure; and the tonic results, mental and physical, have not gone unnoticed by their parents. Thus there has grown up a strong traditional belief, probably well founded in fact, in the benefits resulting from the yearly migration—benefits affecting adult and animal as well as child. And though the Norwegian "bonde," with his inconvenient seter divorced from the great milk market, is no less hard-headed an economist than his counterpart elsewhere, he is unwilling to discard his belief—with a reluctance which increases with the depth of his valley.

The setergrend system, in exploiting both the inclination to continue use of the upland pastures and the growing importance of the dairies,[9] would seem to ensure the survival of transhumance in Norway. The group, and particularly the co-operative group, has an economy in line with present-day trends. Socially, too, it makes concessions to the new age. There being no cheese-making, work is less arduous; while the presence of other workers in the adjoining seters and the convenient daily transport to the local towns means that isolation is only relative. As motor roads ensure that fresh milk efficiently reaches the daily market, and as conditions at the seters are open to official inspection, the modern demands for fresh milk and for a high standard of hygiene are both satisfied.

Of the 26,000 odd farmers owning, or sharing in, seters in 1939 little more than 6000 were able to use motor roads to them. But it is these 6000 who have provided the vital links between dairy and fjell—links which are making possible the survival of a seasonal migration in that part of the country where traditional customs are most obviously sharing the fate of their counterparts elsewhere in Europe.

The photograph of Heggeroi seter was taken by the author. The photograph of Vemork power station, by Messrs. Wiese, is reproduced by courtesy of the Norway Travel Association.

[1] Faegri, K. On the Introduction of Agriculture into Western Norway. *Geologiska Föreningens i Stockholm Förhandlingar*, 1944, 66 (*3*) : 459, 460.

[2] Sandvig, N. Seterbruk og Seterstell. Oslo : Tanum, 1945.

[3] Bull, E. Sammenlignende Studier over Bondesamfundets Kulturforhold. Oslo : Aschehoug, 1929.

[4] Davies, Elwyn. Sheep Farming in Upland Wales. *Geography*, 1935 : 97-111.
—— The Patterns of Transhumance in Europe. *Geography*, 1941 : 155-168.

[5] Garnett, Alice. Insolation and Relief : Their Bearing on the Human Geography of Alpine Regions. London : George Philip and Son Ltd., 1937.

[6] Funder, L. Seterdriften i Norge. Oslo : Gröndahl, 1911.

[7] Fekete, W., Tönsberg. Personal communication, 1946.

[8] Isachsen, F. Vintersaetringen i Vaagaa. *Norsk Geografisk Tidsskrift*, 1938, 7 (*4*) : 208-239.

[9] Statistik Sentralbyrå. Jordbrukstellingen i Norge. 1907 og 1939. Oslo : Aschehoug, 1910, 1942.

HEGGEROI SETER

VEMORK POWER STATION

THE KINCARDINESHIRE PLATEAU

By D. Ronald Macgregor

Familiar names to all Scottish folk are those of the Grampians, Strathmore, and the Buchan lowland. None of these three great regions is alike, and yet they are closely linked in that they become wedged together in the county of Kincardine. No boundaries indicate where each region ends, and yet they do end, for each passes through a natural stage of transition to form a region whose character is distinct from that of its neighbours. This region possesses no individual name ; it has been a passage for traffic, a minor region dwarfed by the economic importance of its greater neighbours. But it is deserving of more attention than this, for whilst it allows vital contact between Buchan and the south, it is a region which has gained the affection of its inhabitants and which has responded well to the labours expended by them upon its land. It must not be left nameless, and the " Kincardineshire Plateau " befits its form and character.

In spite of the caution required in attempting to delimit a natural region, and especially one of a transitional character, there are in this case certain recognisable bounds. The region is roughly triangular in shape : the base lies along the east coast, to the north-west the country overlooks the Dee valley and Aberdeen, and in the south-west there is a falling away to the Bervie valley and the Strathmore lowlands (see Fig. 1). The plateau is of a deceptive nature, for in appearance it seems to consist of rolling hills penetrated in places by deeply incised valleys. Nevertheless on several accounts it must be regarded as a plateau : the general height of the region is between 300 and 600 feet, across the hills there exists a general accordance of summit levels, and whilst there are very restricted areas of land lying below 250 feet, the greater part of the coastline is notable for grand and sheer cliffs rising to anything between 100 and 200 feet from sea level (see Fig. 2). It is when entering or leaving the region that the traveller may receive evidence of its plateau character : along the northern boundary there is a marked descent to the valley of the River Dee and to Aberdeen, whilst looking southward a view is commanded far across the low-lying Howe of the Mearns. It is to be expected that the higher parts of the region are exposed and windswept, and no settlement is found above 600 feet ; below this altitude, the rural population is scattered fairly evenly over the plateau, and what in winter is a landscape of bare country with scattered and forlorn-looking farmhouses, becomes in summer a pleasing countryside of grain fields and hay meadows. The greatest charm lies, however, in the often concealed valleys and ravines which lie within the region. The flow of glacial meltwaters and the uplift of the land have produced the incised character of the streams, and not only do their valleys offer sheltered sites for habitation, but they afford good alluvial farming land and lines of communication. It is within them, too, that are to be found the relics of great woods and the seats of old estates ; indeed, there is a wooded softness about the grounds of Arbuthnott and Fetteresso which is reminiscent of English park lands. Beyond the limits of the plateau lie stretches of beach and sand dunes, but the coast of this region is characterised by great,

awesome cliffs, fascinating caves, and delightful little inlets and coves. It is a dangerous coast both to the landsman and seafarer, and although of little use to the modern fisherman, it is a coast which attracts its holiday visitors summer after summer. Resistant rocks of different types have given the plateau its great eastern buttress, and the intricate play between wave and rock has given rise to a sculpture of thrilling and amazing design.

That the plateau character of this region has had its effects upon the

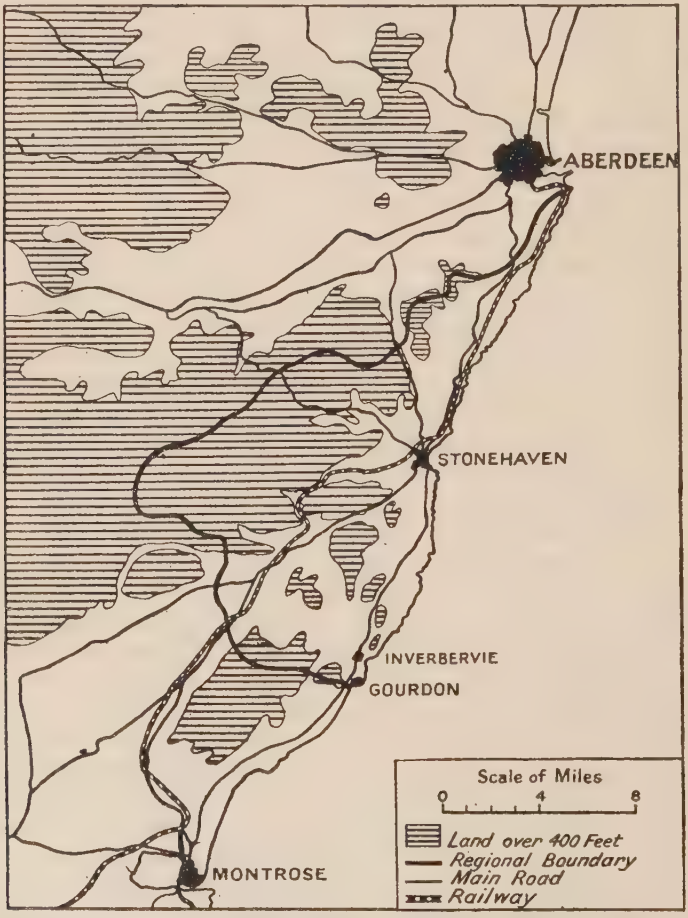


Fig. 1. The Kincardineshire Plateau : Boundary, land over 400 ft., communications.

life of man cannot be doubted. The natural centre is Stonehaven ; it is the regional focus of routeways (see Fig. 1), and is situated upon low and fertile country, besides which it possesses the best harbour along the coast. Aberdeen to the north and Dundee to the south to a certain extent control the economic life of the region, but in essential it leads a life unto itself. The existence of the plateau is very clearly reflected in its effects upon communications ; approaching from the south, the railway is first of all forced to make a detour involving the

use of the Carron valley, and then, between Stonehaven and Aberdeen, it is constrained to follow closely alongside the coastline in order to ensure the easiest possible gradient in the descent to Aberdeen (see Fig. 1). The through roads show less deviation, but there are several long and steep climbs which slow down the rate of travel of commercial traffic. Finally, in respect of land-form and lines of communication, the bottle-neck at Stonehaven is illustrative of how the works of men must conform to a given environment.

Soil, no less than topography, exerts control over life and vegetation, and the Kincardineshire plateau is of notable interest for the contrasts afforded in this respect. Passing south-westward from the area of Stonehaven is the great Highland Boundary Fault, and although it requires a trained geologist to locate its precise alignment, its presence is obvious to any intelligent observer. North of the Fault are to be found greyish rocks of the granitic, gneissic, and schistose types, and the buildings are accordingly of such materials : here, too, the soils are generally of a poor nature, being heavy, wet, stony, and very acid, and tending to a greyish-brown colour. It is largely on account of the

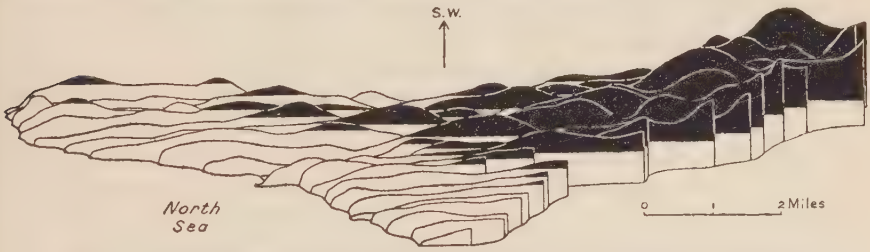


Fig. 2. Kincardineshire : Superimposed profiles. The profiles are parallel to one another, one mile apart. Vertical scale exaggerated 5·28 times. 400 ft. and over shown in black.

resistance of the highland rocks that this northern part of the region is typically plateau country. South of the Highland Fault, however, the presence of Old Red Sandstone and volcanic rocks has resulted in a more undulating and incised surface ; the soils are altogether more fertile, being drier and less stony, and they are conspicuous by their rich, reddish-brown colour. The buildings in Stonehaven and the country southward are predominantly of Old Red Sandstone, a material which gives a much warmer appearance to the houses as compared with the grey houses of Buchan and the north. The fact that the region was glaciated has only served to emphasise the basic differences consequent upon the native rocks : the northern part of the plateau was littered with ice-borne highland stones and boulders, whilst a general veneer of reddish Strathmore boulder clay was deposited over the southern plateau area. Of all the transitions which occur in this region, that of the soil is one of the most obvious.

In common with other regions of eastern Scotland, the dominant occupation of the people is farming; but it is a surprising fact that the windswept and somewhat inhospitable plateau, comprising forty per cent. of the area of the county of Kincardine, contains nearly half of the total livestock and acreage of cropped land within the

county. It was in the true nature of things that farming was late to develop in Kincardineshire. The initial impetus came from the fertile valley estates during the latter part of the eighteenth century, namely, Urie, Fetteresso, Dunnottar, and Arbuthnott. The foundation laid by the leading landowners was sure and strong, full recognition being accorded to the needs for stone-clearing, draining, liming, and enclosing. Through course of time, farming has developed in accordance with the controlling factors of elevation, temperature, rainfall, soil, aspect, slope, and economic conditions, and these, together with the energy and ability of the farmers, make a large contribution to the prosperity of farming within the region. Very important too in this respect are the main rail and road communications, which facilitate the marketing of farming produce. It must also be remembered that the transitional character of the plateau permits flexibility in farming economy, whilst Aberdeen and Dundee give an assured market for such items as milk and potatoes.

The leading grain crop by far is oats, which is, of course, tolerant of the slow-ripening summers and acid type of soil ; this crop is fairly evenly distributed throughout the plateau below 500 feet, and the yield is slightly above the average for Scotland, but the highest yields are found in the south-eastern parishes, as a result of more fertile soil and good drainage. It is in these same parishes, which are also rather drier and warmer than the rest of the plateau, that a small but good crop of barley is grown ; even so the yield is below the average for Scotland, which suggests that the crop is being produced in a marginal area. The two main root crops are turnips and potatoes, the acreage of the former being four times that of the latter. As in the case of oats, turnips are well suited to conditions within the plateau generally, and as a supply of livestock feed in winter they play a vital part in the region's cattle industry. Potatoes, on the other hand, are somewhat more delicate, and though they are grown on all the farms, commercial production is notably limited to two areas. In the northern coastal parishes, the large potato acreage is a response to the demand of the Aberdeen market ; the important potato crop of the middle Bervie lowland reflects the low elevation and loamy, fertile soil of that southern area. It is an interesting fact, that the net variation in yield from year to year is positive in the case of potatoes, but negative in the case of turnips. Thus it may be deduced that the farmers tend to grow potatoes only where good results are assured, but are required to grow turnips for the sake of cattle-feeding, irrespective of the finer, environmental controls. Grassland occupies only about twenty per cent. of the cropped area, but it is essential for resting the soil and for pasturing livestock.

The basis of all farming within the plateau is the rearing and fattening of livestock. Sheep are about three times as numerous as cattle, and they are maintained for the greater part of the year upon the hill pastures ; these rough grazings are about equal in extent to the area of land under crops and grass. But cattle are the most important source of wealth, and particularly beef cattle. These latter are suited to the climate: they are able to forage on the often sloping

fields, and water, grass and turnips are all available in reliable quantities. On the higher and somewhat colder farms inland, there is a concentration upon cattle-rearing ; the milder climate and more subdued topography of the coastal farmlands encourages cattle-fattening. It is, however, the dairying industry of the region which presents striking and surprising facts. In the first place, the percentage of dairy cattle relative to the total for the whole county is higher than that of beef cattle ; and secondly, the average yield of milk per cow is the highest for any county in Scotland. The rise of the dairying industry in the Kincardineshire plateau region indicates a ready appreciation of current market demands, and the high yield suggests that only land truly suitable for dairying has been turned to this purpose.

In summary, then, whilst the general type of farming within this region may be described as livestock-rearing, upon a basis of grass and root crops, in rotation with cereals, yet there are peculiarities which must be noted. Beef-cattle farming is representative of Buchan ; the production of potatoes and barley indicates a link with Strathmore ; and, of course, sheep-rearing is typical of the Grampian moorlands. So once again the transitional character of the plateau becomes evident. This ability of the region to vary its agricultural products is an important economic safeguard to the farmer, but he has not let things stand at that ; the specialisation in potato growing and the modern development of dairying both illustrate a commendable spirit of enterprise and an ability to appreciate the potentialities of land and the presence of markets.

In common with the rest of the county, the Kincardineshire plateau has been subjected to lamentable deforestation during the last eighty years, and to-day even the picturesque and ancient hardwoods of the estates are being felled (see Fig. 3). But now a reafforestation programme is being vigorously and competently carried out by the Forestry Commission. The existence of considerable hill tracts of below 1000 feet in height has encouraged the planting of coniferous trees, and west of Stonehaven, between the Cowie and Carron valleys, a large area is being transformed rapidly from moorland to plantation. The decision to plant land with trees means that it is denied to sheep-rearing or grouse-breeding. With regard to the latter, it may be suggested that there is ample space on the Scottish hills which can never be afforested ; and whilst the altitude check upon planting leaves the higher moorlands free for sheep and grouse, the provision of shelter belts at lower altitudes is very beneficial to livestock as a whole. Nor must it be forgotten that coppices and shelter belts will provide rough timber for general farm purposes. It is to be hoped that the excellent work being done by the Forestry Commission will serve as a lead to landowners and encourage further planting.

Although the summer visitor to the coast of the region may take away memories of fishing boats and fishermen, the fishing industry occupies a very minor position in the present economic life of the people. Indeed, since about 1880 fishing has been declining for a variety of reasons. The crucial fact is that there is no spacious and deep-water harbour capable of accommodating steam trawlers and

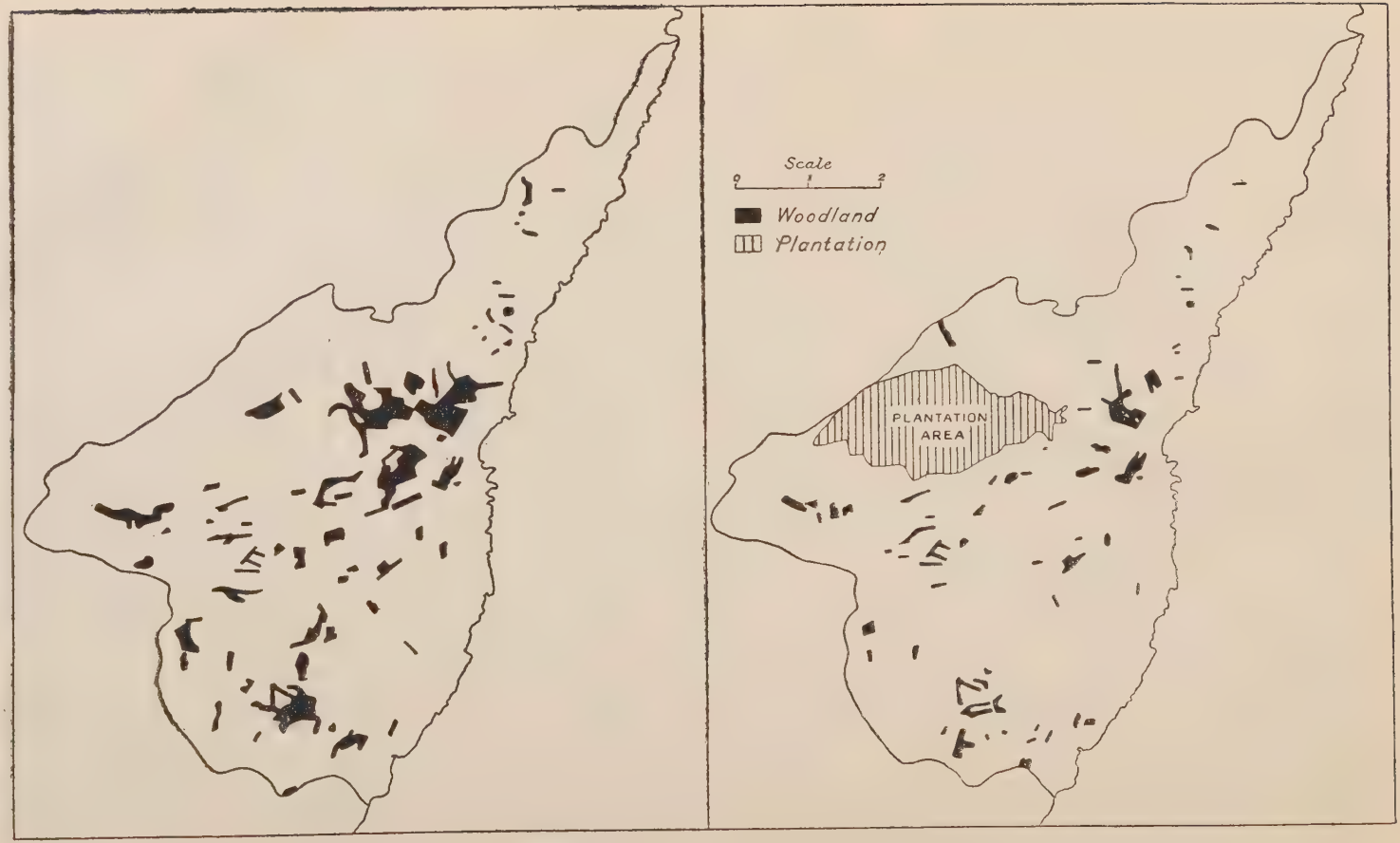


Fig. 3. Kincardineshire Plateau. Woodland in 1868 and in 1947.

drifters. The majority of the fishing harbours along this coast are located in little coves and are capable of accommodating only a few small boats ; in several places the boats have to be hauled up the cliff face out of the reach of the sea, and fishing can seldom be carried on in winter on account of the stormy conditions then prevailing. A further handicap arises out of the decreasing numbers of fish on the inshore grounds, and finally the isolation of some of the villages has played a part in their decline as fishing centres. It is only in the two largest harbours of the region that fishing is still found in any degree of importance. Stonehaven has a harbour which accommodates a fleet of some fifteen seine net boats, and though kippering is carried on and a little fish is despatched by rail southward, the main object of the industry is to provide fish for the local population and the summer influx of holiday-makers. Gourdon has a smaller and more exposed harbour, but has more boats than Stonehaven, and the fishing industry is more highly organised ; this is probably due to the fact that there is little local market, so that the village specialises in railing its catches speedily southward. There is a common, probably unjustifiable, tendency for people to lament the decline of the fishing industry in regions similar to this, but fishing in small boats from these little harbours is dangerous, arduous and seasonal; moreover, the distribution of fish from the big modern ports is cheaper and much more efficient. It is only in the case of very exposed and isolated villages that complete decay has resulted, as at Crawton. On the other hand, the villages of Skateraw and Portlethen have been turned over very successfully to accommodate holiday visitors, and it is indeed a pleasure to live in one of these neat, picturesque, cliff-top villages during the summer months. This adaptation to changed conditions is best illustrated in the case of Stonehaven, where the hotel industry is the most lucrative of any in the town, and where the inhabitants have improved their assets by providing a bathing pool, recreation facilities, camping accommodation, and such like.

The population of the Kincardineshire plateau has been decreasing in numbers since about 1850, and that of the main urban settlements, since 1900. The reasons are several and well known : firstly, the urge to leave the land with its associations of tied labour, primitive housing, isolation, long working hours, and low wages ; secondly, the attractions offered by the cities in the way of higher wages and social amenities ; and in addition there was the depression in farming and the decline of the fishing industry. What, then, are the possibilities for this region of maintaining its population ?

In general the requirements are remunerative work, adequate housing, and the provision of social amenities. Farming must be considered first of all for it is the basis of life within the plateau. It is not enough that farming is thriving at the present time and that high wages are being paid to farm workers ; the provision of modern housing upon the farms is urgently needed and will go far to silence complaints against tied labour. The development of modern road transport makes it possible for rural dwellers to enjoy the social and educational amenities of the urban centres. For this region the presence

of Aberdeen, Stonehaven and Inverbervie is an important advantage. The Forestry Commission has adopted the wise policy of grouping its workers together in modern timber cottages, and of using motor transport to move its workers to the changing locations of work. With regard to the fishing industry, it has been pointed out already how there has been a readaptation to take advantage of the holiday traffic ; but the continued success of this work depends upon the ability of the inhabitants to attract visitors to their localities. The plateau region possesses first-class coastal scenery and attractive inland country ; there is attraction, too, in the relics of the fishing industry ; but the felling, against local wishes, of the picturesque Dunnottar woods near Stonehaven destroyed a local asset.

Perhaps the most difficult problem of all is that of maintaining the population of such a town as Stonehaven ; it has functions—administrative, postal, medical, educational, social, economic—which make its presence essential to the region; but over and above these functions a healthy and thriving community must possess a variety of industries which can utilise workers who may be more or less skilled. In Stonehaven there are minor, but thriving, fish-net, toy, and distilling industries ; the toy industry is particularly interesting in that it is able to absorb surplus female labour after the holiday season is over, and so to cope with the Christmas demand. In Inverbervie, on the other hand, the staple industry is flax spinning, but this is giving way to the production of artificial silk. In addition to the availability of labour, important factors in the establishment of industries within the plateau are the presence of vacant flax factories and the supply of electricity from the grid system. The Stonehaven toy industry and the Inverbervie furniture industry have both arisen as a result of these factors, but it must also be remembered that they are light industries which are able to work with low costs of transport, thus off-setting the major disadvantage of the whole of north-eastern Scotland, which is relative isolation.

The Kincardineshire plateau is a very small part of the British Isles, but it has very definite lessons to teach. There is a fine adjustment of farming in accordance with natural and economic controls, and as a result the industry is thriving ; nor has farming suffered so severely in times of depression as in many other areas, for the ability to vary has been a profitable advantage. But behind the progress of farming there is a long tale of hard work and spirited, intelligent effort, and those who would make changes must not be unmindful of this tradition. It is perhaps strange that, in a region so closely associated with the dogged traditions of Buchan, the people have recognised the inevitable decline of the fishing industry, and have successfully turned themselves to other types of work. And a certain wisdom is evident, for both holiday and light manufacturing industries are well suited to the region's natural endowments.

This harmony between the inhabitants of the plateau and their environment results appreciably from the interplay of many factors, not least from the transitional nature and the potential assets of the region. But whatever the reason may be, the Kincardineshire plateau

has its own peculiar and fascinating character, and one cannot travel there without sensing the spirit of well-being which pervades both countryside and people.

EASTERN LADAKH : FROM THE SHYOK TO THE INDUS VALLEY, 1947

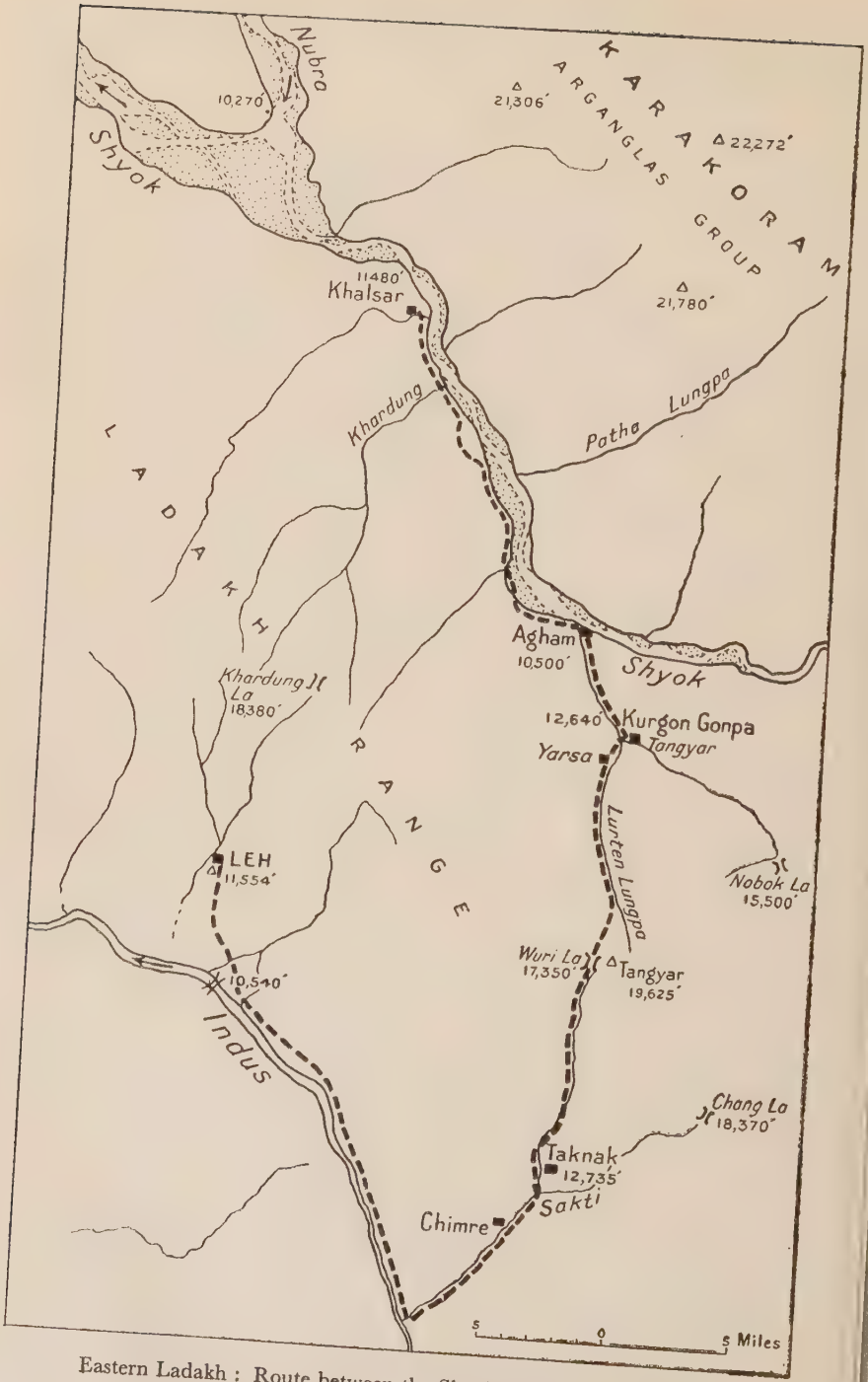
By Col. R. C. F. Schomberg, C.I.E., D.S.O.

Our object in making this detour was to avoid the well-known route which led out of the Shyok valley and was part of the caravan track to Leh via the Khardung Pass (18,380 ft.). We had heard of the Wuri La, and indeed had seen it in the distance from the Sakti valley, and although it meant a detour, we were not pressed for time, and were anxious to see as much as we could of the country.

The starting place was Khalsar on the left of the Shyok, just above the suspension bridge, and a well-known halting place on the way to Central Asia. We started up the left of the river, keeping close to the stream. The route continued by the Shyok as far as Agham, then turned right and almost due south to the Wuri La, and so down the Sakti valley to the Indus. We left Khalsar (11,480 ft.) on a lovely day, the 13th of August, clear and bright with the outlines of the mountains standing out against an azure background ; though let it not be thought that the summer season of the Karakoram is always thus. On the contrary, the weather can be as fickle as it is at home.

We crossed the Khardung stream at river level, and above us, on our right, we could see the caravan track zigzagging up the bare hot spur. The stream was only 18 inches deep, the water was clear and cool, and belts of willow and tamarisk fringed it, with some fields and crofters' houses dotted about. In this barren land, the spectacle was enchanting, and we looked up this refreshing glen and contrasted the delightful verdure with the arid brown cliffs above. Wherever there is water in the Karakoram, there is abundant vegetation, but water is rare and the barrenness of the country, in spite of its great glaciers and lofty snow-crowned peaks, is very great. The air is intensely dry, the snowfall scanty, the desiccation considerable, and above all the evaporation is constant. It is only where the water from some streams can be carried to cultivable ground that crops are possible and man can live. The settled areas are rich, fertile, and delicious but infrequent and usually very small.

At times we left the river's edge to scramble over a spur which was tiresome for the transport animals, a very 'scratch' lot indeed—consisting of ponies, yaks, donkeys, and even a cow, all of which had to be manhandled both up and down these spurs. A month or two earlier the water would have been much lower, and we could have kept to the bed of the river and so have avoided these climbs. At one spot we had to wade in water up to our armpits, and my Hunza lad slipped and fell. However he soon dried. As long as the food and bedding



Eastern Ladakh : Route between the Shyok and the Indus valley.

kept dry, these trivial incidents did not worry us. Our best donkey, however, by name Arabi and a cherished native of Kashgar, had to be towed with care through the water.

We reached Agham (10,500 ft.) to find the barley and wheat cut. It was a warm spot, and we turned due south up the narrow and cultivated valley. Chikor (French partridge) and flocks of pigeon abounded, and we even encountered a stray duck. We camped that night at Tangyar (12,640 ft.) at the junction of the two nalas, one coming south-east from the Nebuk La (15,500 ft.)—better spelt Nobok La—and the other due south from the Wuri La.

There was an impressive monastery at Tangyar which was wrongly marked on the map. It was built against the side of the hill and was in places cut out of the rock. It towered high above the valley, as I realised as I panted up to it, but a fine view was my reward. In the monastery itself was a very dangerous ' gonpo ' or fiend, a most formidable deity and the tutelary demon of the place. The old lama in charge of the shrine would not let me enter the small dark closet in which the image of this fierce godling was installed. It was far too dangerous, and it was no use taking risks, as we both might have been slain outright. These powerful and infernal spirits are not necessarily malignant : they can be propitiated but can never be trusted. As long as the local devils are humoured and appeased, they protect the neighbourhood from the attacks of other evilly disposed divinities.

Looking up from the monastery towards the pass, which was, however, invisible, we could see the summer village of Yarsa with wide fields of ripening barley swaying in the wind. The snow lay low on the approaches to the Nebuk La, for it was the 15th of August, and the short summer was drawing to an end. The ground at Tangyar was golden with *Pedicularis longifolia*, the most lovely of alpine plants and which always grows in marshy ground.

The next day we started our long, steady climb to the pass but failed to reach it. We went up the valley which opened out as we ascended. We first passed through the fields of Yarsa and then through fine upland pastures, dotted with yaks which looked from a distance like black beetles. On the way, we passed some Ladakhis who had just killed a marmot which they were going to eat. It is extremely rare to find these people eating marmots, which most Ladakhis will not touch, though I have found the Kalmucks of Outer Mongolia, Mongols and Buddhists too, regular eaters of marmots, so much so that these cheerful little creatures have almost disappeared.

We camped that night at Lurten Lungpa, and although it was only 15,000 feet, the cold was intense. The night was clear and the stars brilliant, but the abundance of water made the cold greater. From our camp to the crest of the Wuri La was about six miles, and we rose gradually up the open valley. It was cold, with a bitter wind, and the sun only came late on our track. The last half-mile to the pass was steep and stony, but for a pass, very easy. We made the height of the pass, 17,350 feet, by hypsometer. Standing on the top, surveying the scene and discussing the position which one always does if the wind and cold allow, we decided that the Wuri La was very easy

indeed, but its drawback lay in not being on any of the main routes. The native of Ladakh, slow in mind, maddeningly deliberate, indifferent to time and scorning haste, insists always on taking the nearest way from one place to another, and thus it is that he uses the Khardung La with its steep northern fall, its perennial glacier, and its accompanying discomforts in preference to any easier but longer route. So the Wuri La will never be more than of local importance in a land where an extra and unnecessary day spent on a journey is regarded with horror by a race whose one idea of pleasure and enjoyment in life is to sit and drink tea by the potful. And, after all, why not? The Ladakhi is cheerful, contented, healthy, and unenterprising, and as far as he himself is concerned, he has solved the problem of life.

Late in the season though it was, the flowers were still abundant. On both sides of the pass gentians (*Gentiana nubigena*) grew luxuriantly, whilst the Himalayan aster, *Pedicularis rhinanthoides*, *Saussurea sorocephala*, *Inula*, *Allardia glabra*, rock rose, and other less amusing plants were abundant. I indeed regretted that I had not been at Lurten Lungpa a month earlier, when the flowers would have been magnificent as the tattered remnants of many primulas proved. The view from the pass was rather marred by cloud. To the north-west Mount Godwin Austen (K 2) was just visible although much hidden by the Saser Kangri group. We could also see the whole of the Arganglas Group as well as the lesser peaks to the East, through which the Shyok forced its way as it flowed from the North. Looking southwards, the view was much less attractive. There are few impressive peaks in the Southern Ladakh and Zanskar region, and we had but a dull vista of monotonous mountains, all much of a size, with scanty snow and a preponderance of aridity.

We went down the dry southern slopes towards the Sakti valley. The snowfall here was never abundant, and facing the south, it soon melted and the water flowed away lasting but a short while. Thus it was that we failed to find any water at all until we reached Taknak, at the foot of the descent from the pass. We now felt quite warm as the height was only 12,735 feet. There was a most impressive monastery, comparatively new and built into the face of the cliff which in many places had been hewn to make shrines, places of worship, and rooms for the monks. We were told that the monastery was directly under Lhasa. Every one was very agreeable and anxious to show me over the monastery, but then I have usually found lamas to be friendly and even eager to display their religious wares.

We were now in the valley usually known as the Sakti which led from the Indus River, passed the great monastery of Chimre to the Chang La (18,370 ft.), which is the chief pass of Eastern Ladakh leading to the borax and salt deposits beyond Chang Chenmo as well as to Shushal and other settlements, of considerable local importance but otherwise of no interest. After a day's halt, we continued down the valley to Chimre, and eventually reached Leh.

NORTHWARD VIEW FROM WURI LA

G A MARMOT AT LURTEN LUNGLA

LAMAS AT TAKNAK

LAMASERY AT TANGYAR

GEORGE WALKER, F.R.S.G.S.

THE RETIRAL OF MR. GEORGE WALKER, F.R.S.G.S.

FIFTY years' service is no small period in the life of a society; it is an even greater proportion of a man's life. It is with satisfaction and gratitude, therefore, that we record its culmination on the retiral this summer of Mr. Walker from the Secretaryship of the Royal Scottish Geographical Society.

Those with long memories can recall the stately and benign figure of Colonel Fred Bailey, R.E., Secretary of the Society from 1892 to 1904. The Council had been experiencing trouble in staffing the library and in 1898 instructed him to engage an assistant. The salary offered was a miserable one, and the prospects of promotion almost nil. The successful candidate turned out to be a lad of 14. He had had no previous library or secretarial experience. Beyond a sturdy constitution gained in trudging the Braes of Balquhidder—his home from home—with the gamekeepers, his principal asset appears to have been an engaging smile. Some predicted the chances of his remaining to be slight, but they reckoned without knowledge of the persevering spirit of George Walker. For it was he who thus won his introduction to the Society.

In the years that ensued we find him constantly striving to improve his knowledge of books and matters geographical, always going out of his way to oblige members, bearing, in the frequent absence of the Secretaries, an ever-increasing share of the Society's administration. In his spare time he was never idle. He assisted Dr. William Spiers Bruce and took charge of his records and library. In similar manner he looked after the library of Dr. Walter B. Blaikie and catalogued his historic collection of Jacobite literature.

The record of the Society's activities during these years is the drama of a great nation's travail in discovery and empire-building, in demonstrating what the human spirit is capable of in overcoming danger and selfish materialism. In its pages we find, amongst many famous names, those of Dr. Fridtjof Nansen, Dr. Sven Hedin, Sir Harry Johnston, Commander Peary, Sir John Murray, Captain Roald Amundsen, Dr. W. S. Bruce, Sir Ernest Shackleton, and Captain Scott. All of these learned to appreciate the devotion and personal interest shown in them by the Assistant Secretary. He became the lifelong friend of many, and received tributes of a touching nature from several. Shackleton thus in 1920, perhaps with some premonition of his fate, handed over a copy of his book autographed "In memory of old days and in appreciation of this last lecture."

When in 1925 the late Dr. George G. Chisholm resigned the post of Secretary, George Walker was appointed to succeed him, and held this important office during the ensuing twenty-three years. It has been marked not only by length and faithfulness of service, but by the successful negotiation of difficult periods caused by the war, and of the triumphal celebration of the Society's Jubilee.

Among Mr. Walker's research work should be mentioned the Bibliography of the Place-Names of Scotland, which he completed in 1945. His assistance in completing the Society's memoir on The Early Maps of Scotland was also important, while without his labours

it is doubtful if the revised second edition would ever have seen the light of day. Several other scientific societies in Edinburgh have benefited by his activities as their honorary librarian, occasionally as assistant secretary, and particularly, by his fruitful endeavour to assemble their headquarters under one roof, the Synod Hall thus becoming something of an Edinburgh Athenaeum.

George Walker served with distinction in the Royal Scots during the First World War. During the Second, he took an active part in the training of the Home Guard. In both of these his reliability and modesty were well known and appreciated by his comrades-in-arms. Unfortunately, it was owing to this self-devotion on the latter occasion that he had a serious accident in 1943, an accident which might well have proved fatal to one of less sturdy constitution, but from which he made a wonderful recovery.

In 1946 Mr. Walker was awarded the Honorary Diploma of Fellowship in front of the whole Society. On March 11 of this year he was awarded a handsome testimonial subscribed to by over 400 members. Happily Mr. Walker is still with us and contributing important services to our map collection, but on his retiral as Secretary and in his approaching retiral from the staff he carries with him from his many friends a widespread expression of good wishes for his future health and well-being. J. B.

APPOINTMENT OF SECRETARY

Captain J. F. W. Hawkins, R.N. (Retired), was appointed Secretary to the Royal Scottish Geographical Society in succession to Mr. Walker, and assumed duty on 1st May 1948.

Captain Hawkins, both during his career in the Senior Service and in the course of private travel, gained extensive knowledge of many lands and seas, especially of Mediterranean countries, the Americas, and the Far East. This knowledge, combined with his wide administrative experience, will be of outstanding value to the Society, and his appointment is very cordially welcomed.

GEOGRAPHICAL PAPERS

The Reconnaissance Vegetation Map of Scotland

Report of the Paper read by Dr. Arthur Geddes and of the ensuing Discussion at the Meeting of the Society on April 23rd, 1948. The President was Chairman.

Dr. Geddes explained that the map had been undertaken at the suggestion of Dr. Dudley Stamp as a complement to the Grassland Map for England and Wales. The map for Scotland could not take the same form as the English one as there was no recent survey comparable to that carried out south of the Border by Davies and Stapledon. The most comprehensive survey was the one published by Marcel Hardy in 1906, itself based on earlier work by the brothers Smith and covering the greater part of Scotland north of the central belt.

Hardy's survey and classifications had been taken as a basis. The boundary of the improved land and woodland had been corrected from the Land Utilisation Survey maps and, where possible, Hardy's work had been extended and revised from more recent surveys of smaller areas carried out by a variety of people, the sources being indicated in an introductory statement to the key to the map. Dr.

Geddes suggested that a guide to land use should be added to the ecological classification as the plant associations were affected by the type of grazing. The three areas of land use that he suggested were:—(1) deer forests where vegetation was usually strong and coarse; (2) crofters' common grazings; (3) sheep farming where the absence of cattle and the regular burning of heather encourage bracken.

The map was one of a series of 10-mile maps intended for planning purposes, some of which were already published. Each was accompanied by an explanatory pamphlet and it was intended in this case to emphasise that the map was not based on a large-scale uniform survey and to give some indication of the degree of reliability in different areas.

The map was intended both as a statement of the present state of knowledge and as a challenge to ecologists to amplify and extend the work on which it had been based. Provided that the degree of accuracy was fully realised the map should be useful as there was no other comprehensive vegetation map. The publication, even of an incomplete map, was worth while in such circumstances as had been realised by the Geological Survey who had boldly stated on their published Geological Map that a large portion of the Highland area had not been surveyed in detail.

Dr. Willatts said that he had been connected with the map in an editorial capacity in collaboration with Dr. Stamp. He felt that for this map in particular there was need for a carefully prepared explanatory pamphlet, and agreed with Dr. Geddes that a reliability diagram would be valuable. There had been some criticism of the association of two very different types of information on the northern sheet of the 10-mile map, and Dr. Davies had suggested that from information collected during the Grassland Survey it should be possible to cover the northern part of England on the same basis as Scotland. Dr. Willatts was hopeful that if this could be done the rest of England might be completed and perhaps a map of grassland types corresponding to the English sheets eventually produced for Scotland.

Dr. Wylie Fenton emphasised the importance of calling the map a reconnaissance one. The information was very much generalised, but a detailed survey by comprehensive field observation and traverses would require an organisation comparable with that of the Geological Survey. Dr. Fenton pointed out two possible sources of error which might arise from the map. Not all areas with the same dominant plants could be treated in the same way, although they might be classified together. The nature of the soil and subsoil might vary and such distinction could not be shown on a 10-mile map. Also, the vegetation had in some cases altered since Hardy's work was done some fifty years ago. An explanatory pamphlet would, however, go a long way towards meeting these difficulties and would increase the value of the map. A larger scale was undoubtedly needed, however, for detailed work.

Professor Ogilvie agreed that there was some danger of the general public's arguing by analogy with the better-known maps of the Ordnance Survey, and assuming that, because large-scale surveys had been the basis of the 10-mile topographical maps, the vegetation map had been compiled in the same way. The pamphlet should carry this warning.

Mr. Macdonald (Forestry Commission) restated Dr. Fenton's warning of the dangers of broad uniform classifications. He also stated that unexpected changes of vegetation might arise from a change in the farming practice—for example, when the burning of grazing ceased. A census of woodland was being carried out and would be kept up to date. This might be used in a revised edition of the vegetation map.

Dr. Simpson (Geological Survey) stated that there should be considerable correspondence between the drift and vegetation maps. The main discrepancy was in the peat areas which were considerably larger on the drift map. All peat of 2 feet thickness and more had been marked on this, whereas a standard of 4 feet had been taken for the vegetation map.

Dr. Miller thought that the use of the word "reconnaissance" was misleading as the map was the result of compilation, not reconnaissance.

He also felt that there was some confusion in the classifications used as some were based on land use and some were botanical. A fresh survey of the present use of land might be better than an attempt to define the ecology. As it was, the ecological detail was given only for the upland areas, while there was similar variety of

vegetation in the areas classified together as "improved land." He suggested a splitting up of the areas classified as waste land and rough pasture in the Land Utilisation Survey into their land-use types.

Professor OGILVIE suggested that "Provisional" might be used instead of "Reconnaissance."

Captain SLEEP (Ordnance Survey) suggested that the map should be called a "Provisional Compilation."

Mr. CLERK suggested that an indication of the prevalence of bracken should be given as it has spread considerably in areas where there are no cattle. The map should have considerable educational value.

Dr. MCQUEEN COWAN agreed with Dr. Fenton that larger-scale maps were needed for detailed work, but thought that the 10-mile map gave a reasonably accurate general picture. He thought it a mistake to mix land use and the classification of vegetation on one map. There was need for a Botanical Survey Department in this country similar to that already working in India.

Dr. WILLATTS agreed with earlier speakers that the pamphlet should be detailed. Some statement of the vegetation types included in the group represented by each colour should be given.

Professor OGILVIE expressed the hope that a second edition of the map might be made later incorporating more recent information where it existed, together with other information obtained from traverses and air photographs.

Dr. GEDDES thanked the various speakers for their constructive criticism and general approval of the map and pointed out that a small-scale map of this type was essential when questions of general policy in planning were being considered. He agreed that larger scales were needed when the policy was to be put into operation in specific areas. J. B. F.

NOTES AND REFERENCES

EUROPE

REPORT ON THE SNOW SURVEY OF GREAT BRITAIN FOR THE SEASON 1946-7. By E. L. HAWKE and D. L. CHAMPION. *Journal of Glaciology*, 1948, 1 (*3*) : 124-133. 1 fig.

THE ISLE OF MULL : A GEOGRAPHICAL RECONNAISSANCE. By M. J. PROUDFOOT. Abstract : *Annals of the Association of American Geographers*, 1948, 38 (*1*) : 67-68.

THE HILL VILLAGES OF ENGLAND AND WALES. By D. SYLVESTER. *Geographical Journal*, 110 (*1-3*) : 76-93. 7 figs.

KING'S COLLEGE GEOGRAPHICAL SOCIETY, 6 Sydenham Terrace, Newcastle upon Tyne, 2, is now publishing a magazine which fills the gap left by the cessation of the *Journal of the Tyneside Geographical Association*. No. 1 ($9\frac{1}{2} \times 6\frac{1}{2}$. 16 pp.), issued in April 1948, is entirely the work of students, advised by Professor Daysh. It contains articles on "French Urbanism from an English Viewpoint," by A. R. PEACE ; "Regionalism," by DAPHNE P. STEPHENSON ; "The History of the Society," by P. JOY LAING ; "Mineral Extraction in North Derbyshire" (with 2 sketch maps), by P. JOY LAING ; "Geography in the Field," by H. LISTER ; "Pioneer Settlement—A Problem in Human Geography," by R. A. DONKIN.

THE REGIONAL GEOGRAPHY OF THOMAS HARDY'S WESSEX. By H. C. DARBY. *Geographical Review*, 1948, 38 (*3*) : 426-443. 3 sketch maps.

IRISH TOPOGRAPHICAL TERMS. By E. G. QUIN and T. W. FREEMAN. *Irish Geography*, 1948, 1 (*5*) : 151-155. 14 references. Cf. *S.G.M.*, 1947, 63 (*2*) : 84.

TULLAMORE AND ITS ENVIRONS, Co. OFFALY. By T. W. FREEMAN. *Irish Geography*, 1948, 1 (*5*) : 133-150. 2 figs.

Physical features, agriculture, development, and functions are described ; with a land-utilisation map of the district and a plan of the town.

SOIL DESTRUCTION IN NORWAY. By AA. LODDESOL. *Norsk Geografisk Tidsskrift*, 1947, 11 (*5-6*) : 238-246. 1 fig.

THE REINDEER INDUSTRY OF NORWAY. By O. Vorren. *Norsk Geografisk Tidsskrift*, 1947, 11 (*5-6*) : 199-220. 4 figs. English summary : 218-220.

THE FEDERAL STATE OF SOUTH-SLESVIG. By M. Vinding and L. Hansen Larsen. 6×4½. Pp. 23. Copenhagen : F. Bagges Kgl. Hofbogtrykkeri, 1948.

DEMOGEOGRAPHY OF THE SOUTH-EASTERN GRAND TRUNK LINE (PARIS–LYON–MÉDITERRANÉE). By A. Chatelain. *Les Études Rhodaniennes*, 1947, 22 (*1-4*) : 35-82. 18 figs. 33 references.

Population studies in France have hitherto mainly been based on data referring to administrative divisions. The present study deals with changes in population density in zones 5, 10, 15, and more than 15 kilometres on either side of the P.L.M. railway from Paris to Menton, subdivided into four sections, each showing a certain geographical unity. It is concluded that, between 1866 and 1936, approximately 2,000,000 inhabitants from other regions have settled along the trunk line.

HYDRO-ELECTRIC WORKS AND SCHEMES IN THE FRENCH ALPS. By G. Veyret-Verner. *Revue de Géographie alpine*, 1948, 36 (*1*) : 169-174. Sketch map.

THE WEISSFLUHJOCH RESEARCH INSTITUTE. By E. Bucher. *Journal of Glaciology*, 1948, 1 (*3*) : 134-139. Plan of laboratories. 4 photographs.

A brief article on the permanent centre for the investigation of snow and avalanche problems established near the terminus of the Parsenn funicular railway at the Weissfluhjoch.

SOIL AND WATER CONSERVATION IN ITALY. By A. Alfani. *Food and Agriculture*, 1948, No. 4 : 281-285. 18 references.

AGRICULTURAL REGIONS OF EMILIA AND ROMAGNA. By G. Merlini. *L'Universo*, 1948, 28 (*3*) : 257-272. Map (1 : 500,000).

First part of a discussion of the regions, which are shown on a map in eight colours.

THE RENAISSANCE OF CZECHOSLOVAKIA. By P. George. *Annales de Géographie*, 1947, 56 (*302*) : 94-103. 5 photographs.

A survey of post-war resettlement, agrarian reform, and re-organisation of industrial economy.

CZECHOSLOVAKIA'S TERRITORIAL AND POPULATION CHANGES. By J. Shute. *Economic Geography*, 1948, 24 (*1*) : 35-44. 3 figs.

POPULATION CHANGES IN POLAND, 1931-1946. By H. Halicka. *Czasopismo Geograficzne*, 1939-1946, 17 (*3-4*) [64] : 123-133. English summary.

ASIA

FISH FARMING IN THE MIDDLE AND FAR EAST. By C. F. Hickling. *Nature*, 1948, 161 (*4098*) : 748-751. Photograph.

A JOURNEY THROUGH THE TIHAMA, THE 'ASIR, AND THE HIJAZ MOUNTAINS. By W. Thesiger. *Geographical Journal*, 1948, 110 (*4-6*) : 188-200. 9 photographs. Map (1 : 1,000,000).

A RECENT VISIT TO HUNZA-NAGIR. By F. W. Long. *Journal of the Royal Central Asian Society*, 1948, 35 (*2*) : 161-167.

THE PARTITION OF THE PUNJAB AND OF BENGAL. By O. H. K. Spate. *Geographical Journal*, 1948, 110 (*4-6*) : 201-218. 8 figs. Discussion : 218-222.

THE NATURE OF THE BHAGIRATHI RIVER. By S. Ghosh. Abstract : *Annals of the Association of American Geographers*, 1948, 38 (*1*) : 79.

The westernmost channel of the Ganges delta, and main course of the Ganges until the sixteenth century, has progressively deteriorated, a process which may adversely affect the prosperity of the port of Calcutta.

FORESTS AND FORESTRY IN BURMA. By J. D. Atkinson. *Journal of the Royal Society of Arts*, 1948, 96 (4772) : 478-490. 6 figs.

Forested areas and government reserved forests are mapped.

THE NEW KACHIN STATE. By C. W. North. *Geographical Journal*, 1948, 110 (*4-6*) : 251-254. 1 fig.

Data relating to the State established January 4, 1948, and which comprises the districts of Myitkyina and Bhamo in North Burma ; with a sketch map showing the frontiers.

TIBET AS A GRAZING LAND. By F. Kingdon-Ward. *Geographical Journal*, 1948, 110 (*1-3*) : 60-75. 1 fig. 3 plates.

AN INNER ASIAN APPROACH TO THE HISTORICAL GEOGRAPHY OF CHINA. By O. Lattimore. *Geographical Journal*, 1948, 110 (*4-6*) : 180-187. 1 fig.

"THE NEW DOMINION." By N. L. D. McLean. *Journal of the Royal Central Asian Society*, 1948, 35 (*2*) : 131-139. Discussion : 139-143.

A lecture on conditions in Sinkiang (Chinese Turkestan).

SOME BASIC PROBLEMS OF GEOGRAPHICAL RESEARCH ON CHINA. By C. Y. Hu. Abstract : *Annals of the Association of American Geographers*, 1948, 38 (*1*) : 75-76.

THE PRE-WAR POPULATION OF CHINA : DISTRIBUTION AND DENSITY. By J. W. Alexander. *Annals of the Association of American Geographers*, 1948, 38 (*1*) : 1-5. Map.

The only population data available are conflicting estimates, the author considering the best to be 458,915,439, according to Huang Yong Hu. There are five major areas of dense settlement—Yangtze Delta, North China Plain, Szechwan Basin, Central Basin of the Yangtze, and South-east Coast—all associated with low relief and alluvial soils.

AFRICA

AFRICAN PENEPLAINS. By J. Dresch. *Annales de Géographie*, 1947, 56 (*302*) : 125-137. 3 photographs.

CAMBRIDGE ARCHAEOLOGICAL EXPEDITION TO CYRENAICA. By C. B. M. McBurney, R. W. Hey, and W. Watson. *Nature*, 1948, 161 (*4087*) : 327-328.

Correlation between the Paleolithic succession in the coastal area and marine Pleistocene succession was investigated during the summer of 1947. A further expedition is being planned.

GEOGRAPHICAL RECONNAISSANCE IN SINAI. By E. de Martonne. *Bulletin de la Société Royale de Géographie d'Égypte*, 1948, 22 (*3-4*) : 105-136. 7 figs. 11 plates.

Geomorphology of the northern plains, eastern escarpment, central mountains, and western coast region.

IRRIGATION OF THE WILDERNESS OF ETHAM. By Aly Bey Shafei. *Bulletin de la Société Royale de Géographie d'Égypte*, 1948, 22 (*3-4*) : 151-155. 4 plates (maps and diagram).

Summary of a project to make extensive areas in the eastern desert of Egypt available for farming and horticulture.

LAKE KIOGA OR LAKE IBRAHIM? By H. Awad. *Bulletin de la Société Royale de Géographie d'Égypte*, 1948, 22 (*3-4*) : 157-161. Sketch map. 9 references.

Evidence and a plea in favour of retaining the name Lake Ibrahim, given in 1874 by Colonel Chaillé-Long, and accepted by Gordon Pasha, instead of the name Lake Kioga figuring on maps of the present day.

THE GEOLOGY AND MINERAL RESOURCES OF KENYA. By W. Pulfrey. *Bulletin of the Imperial Institute*, 1947, 45 (*3*) : 277-299. 4 photographs. 3 maps. List of official reports and maps.

ASHANTI SURVEY, 1945-46 : AN EXPERIMENT IN SOCIAL RESEARCH. By M. Fortes, W. R. Steel, and P. Ady. *Geographical Journal*, 1948, 110 (*4-6*) : 149-177. 7 figs. 6 photographs. Discussion : 177-179.

SOME PHYSICAL ASPECTS OF THE BELGIAN CONGO. By E. Polinard. *Bulletin de la Société Royale de Géographie d'Anvers*, 1946-1947, 62 (*2*) : 181-215. 10 figs.

THE BIRTH OF A NEW AFRICAN VOLCANO. *Illustrated London News*, 1948, 213 (*5699*) : 32-33.

Eight photographs of volcanic activity near Lake Kivu, Belgian Congo, and of Kituru Nyefunsi, the new volcano born March 1-2, 1948.

GROWING POPULATION OF THE CONGO. *African World*, January 1948 : 20.

Extract of statistical information from a recent report by the Vice-Governor-General of the Belgian Congo.

AMERICA

THE EARTHQUAKE PROBLEM IN THE WESTERN HEMISPHERE. By E. P. Hollis. *Bulletin of the Pan American Union*, 1948, 82 (*2*) : 86-100. 7 figs. (*3*) : 147-150.

Discussion of destructive earthquakes and of structural engineering problems involved, with an annotated list of the more noteworthy earthquakes in the western hemisphere since 1797, and maps showing location of their epicentres. Recommendations are made for a comprehensive research programme.

THE GEOGRAPHICAL BUREAU. *Canadian Geographical Journal*, 1948, 36 (*1*) : 39.

Note on the recent establishment of the Geographical Bureau, Department of Mines and Resources, Ottawa. Dr. Trevor Lloyd has been appointed Chief of the Bureau, the purposes of which are " to collect, organise, and make readily available for the use of all branches of the government, geographical data about Canada and foreign areas of importance to Canada."

THE INFLUENCE OF THE FRONTIER ON NIAGARA SETTLEMENTS. By J. W. Watson. *Geographical Review*, 1948, 38 (*1*) : 113-119. 4 figs.

SASKATCHEWAN. By J. Wright. *Canadian Geographical Journal*, 1947, 34 (*3*) : 108-136. 57 photographs. Highway map. Sketch map of geographic regions.

FIRST AMERICAN ASCENT OF MOUNT ST. ELIAS. By M. M. Miller, *National Geographic Magazine*, 1948, 93 (*2*) : 229-248. 20 illustrations. Map.

An account, by the leader of the Harvard Mountaineering Club Expedition, of the ascent made in July 1947. The summit (18,008 feet) was reached on the 205th anniversary of the day when Bering first sighted and named the peak.

NEW WESTMINSTER, B.C. By T. R. Weir. *Canadian Geographical Journal*, 1948, 36 (*1*) : 22-38. 9 figs. 19 photographs.

Description of the site, functions, and development of the former capital of British Columbia.

REVIEWS OF BOOKS

EUROPE

Europa : Bilder seiner Landschaft und Kultur. Edited by Martin Hürlimann. Introduction by Carl J. Burckhardt. 12×8½. Pp. xix+279. Zürich : Atlantis Verlag AG. Second edition, 1947. 28 *fr.*

The intention of this excellent collection of photogravures, with explanatory notes, is to portray the European landscape, more especially the man-made landscape, as a symbol of the unity in diversity of the common European heritage. From Greece to Norway, and from Ireland to Russia, each country is represented by carefully selected and splendidly reproduced views.

The selection, like an anthology, includes many items of universal choice, whereas other entries reveal the idiosyncrasy of the compiler. Here, Europe is viewed through Central European eyes ; a Peripheral European would have brought some different aspects into focus, at the same time retaining many identical images. The choice of views representative of Scotland, for instance, is debatable, but that of an exceptionally fine air photograph of Edinburgh could not be bettered.

The quality of the photographs themselves, of their reproduction, and of the explanatory notes is satisfying. The book merits attention in this country on account of its contents and also as an example of Swiss book-craft. J. H. K.

Scotland's Changing Population. Edited by A. M. STRUTHERS, Secretary, The Scottish Council of Social Service. Foreword by Sir Hector Hetherington. $9\frac{3}{4}\times7\frac{1}{4}$. Pp. 52. 13 diagrams. 7 plates. London : The National Council of Social Service, N.D. 3*s* 6*d*.

The Scottish Council of Social Service are to be congratulated on bringing to the notice of the Scottish people some of the salient facts and figures regarding the grave population problems which face their country. The present booklet comprises seven papers read at a conference on Population, held at Dunblane in 1946, and revised in the light of the discussions which followed. It is attractively produced, and is illustrated by photographs of typical Scottish settlements, graphs, and population pyramids, the last showing the ages of the people of Scotland and of its major divisions in 1871 and 1931.

Mr. J. G. Kyd, the Registrar-General, in " Facts about Scotland's Population," stresses the tendency to extreme concentration in certain small areas and severe depopulation in many wide areas. He analyses the changes in ages since 1871, with the smaller number of children and the increasing number of old people, and he concludes that the most important factor affecting the future is the attitude of the people towards emigration. Mr. T. B. Manson assesses the causes and the effects of rural depopulation, and shows how changed ideas on nutrition and the national outlook on agriculture may help to promote a better balance between town and country. Mr. P. H. St. John Wilson, in a paper on " The Relationship of Population and Industry," points out that wise planning of new industries with respect to situation and age, sex and qualifications of workers employed, could contribute to the same end.

Sir Frank Mears considers the planning problems of Central and SE. Scotland, especially those related to the increase of population likely in the coalfields within the next generation, and to the revival of the rural areas. Mr. R. Grieve, in " The Clyde Valley Region," reviews the effect of the Glasgow conurbation in drawing people from the Highlands and other rural areas, the disadvantages of areas concentrating largely on one industry, and some tendencies to decentralisation already at work.

Mr. H. A. Rendel Govan contributes an article on population changes during 1881-1931 in the crofting counties. He gives illustrations of the big decreases in population, the very few children and the large proportion of old people, and he analyses the causes at work. He fears that, unless some drastic action is taken soon, the peninsular and western parts of the Highlands will be empty in a generation or less. Mr. Robert Hurd strikes a note of qualified optimism in " Lewis : A Special Problem "—special because the decline of population set in there only in 1911, some seventy years later than on the mainland. He believes that the vigour of the population is such that there are good grounds for hoping that the population problem will be resolved, provided the questions of housing, community services and industry are tackled without delay.

C. P. S.

The Scottish Railway Network : A Project for Reconstructing the Scottish Railways according to certain New Railway Network Principles. By J. F. POWNALL. 10×6. Map. Pp. 72. 5 figs. Birmingham : Cotterell and Co., 1946. 8*s* 6*d*.

The author maintains that transport is a matter of routes and of networks, and not of area, and that the eclipse of the former locally directed railway companies has caused enormous loss to Scotland. While railway speeds are more or less adequate, continuity of movement is not, and his present book explains how the railways of Scotland could " be recast according to certain new railway network principles which ensure a fast journey from any one station to any other."

In his *New Railway Network Principles* (1940), the author introduced timing rules based on the idea of hour, or period, sections, the sequence of trains being at one hour, or twenty minute, intervals. The operation of the new sectional Scottish network would necessitate a number of constructional problems, and these are discussed, as are also other suggestions for the improvement of passenger and freight transport.

However visionary the project may appear to be at the present time, its several facets are conducive to reflection.

J. H. K.

Edinburgh. Photographs by S. W. COLYER. Foreword by Sir John I. Falconer, LL.D., W.S. 11½×9½. 33 reproductions in gravure, each with a commentary. London and Melbourne: Ward, Lock and Co. Ltd., 1947. 7*s* 6*d*.

Of the various publications depicting the British Isles, the *Fair Britain* Series reaches a very high standard of photography and reproduction, a standard which is fully maintained in this volume. The illustrations and commentaries, and the introduction by the former Lord Provost, will ensure the popularity of this acceptable addition to books on Edinburgh. J. H. K.

English Country Crafts: A Survey of their Development from Early Times to Present Day. By NORMAN WYMER. 8½×5½. Pp. xi+116. 149 illustrations from photographs and drawings. London: B. T. Batsford Ltd., 1946. 12*s* 6*d*.

This is not a nostalgic history of bygone craftsmanship but a survey of the country crafts which have survived the mechanisation and centralisation of production. It is a well illustrated and comprehensive survey, and reveals that, although a great number of handicrafts are still living, many may die with the aged craftsmen who practise them. For the geographer, the chief interest is the link between local raw materials used by the craft and the problem of their survival. Mr. Wymer declares that no artificial sentiment should keep them alive, but that some at least may be suitable as a basis for the revival of country industries. B. D. B.

Epping Forest: Its Literary and Historical Associations. By WILLIAM ADDISON. 8½×5½. Pp. xii+240. 32 illustrations. 2 maps. London: J. M. Dent and Sons Ltd., 1946. 12*s* 6*d*.

Those whose interests are wide enough to include geography, literature and history will appreciate the attempt to link them in this regional study. History predominates, but much of the changing character of Epping Forest is mirrored in Mr. Addison's procession of historical and literary figures as they pass through the Forest, and their deeds and comments provide a ready collection of material for historical geography. Two maps compare the Forest and its neighbourhood in Camden's time with the region of to-day, and there are reproductions of early drawings side by side with modern photographs. B. D. B.

Sussex. By REGINALD TURNOR. 9×7. Pp. 48. Drawings by Michael Rothenstein. 53 photographs. 2 maps. London: Paul Elek (Publishers) Ltd., 1947. 9*s* 6*d*.

One of a new series called *Vision of England*, this is a very personal account of his native county by an author who knows it well and loves enthusiastically the greater part of it. He is by no means always inclined to accept received opinion either of landscape or architecture—the views expressed and the associations are his own. His pictures of old historic towns, of pleasant villages and farm-houses, of ancient castles and abbeys, of modern mansions in well-kept parks, of rolling hills, of quiet rivers, of unsuspected harbours from some of which the sea has fled, would surely convince even the complete stranger that Sussex is indeed an attractive land " full of a number of things " and offering something of everything.

This is really a very nice book. The maps are good; the illustrations are numerous and all interesting. R. T. C.

Severn Tide. By BRIAN WATERS. 8½×5½. Pp. vii+183. 16 illustrations. Map. London: J. M. Dent and Sons Ltd., 1947. 15*s*.

There is a distinct freshness in both the content and style of Mr. Waters' book, which can only be interpreted as resulting from his long acquaintance with and love of the lower reaches of the Severn. In the early chapters his descriptions of the phenomenon of the " bore " are particularly vivid. Some of the most delightful pages are devoted to illustrated accounts of traditional methods of fishing and their associated crafts.

This record is to be welcomed in an age when such long-practised and often hereditary arts are fast disappearing. The interest and value of the book are greatly enhanced by the inclusion of an excellent map—an important feature unfortunately often omitted in works of this nature. R. M. P.

Devon and Cornwall : A Preliminary Survey. By The Survey Committee of the University College of the South West, Exeter. Foreword by John Murray. 9½×7. Pp. iv+318. 38 figs. 13 maps. 7 charts of industrial employment. Exeter : A. Wheaton and Co. Ltd., 1947. 31*s* 6*d*.

Here in a single bulky volume is a statistical and discursive account of the occupations of man and the distribution of population in Devon and Cornwall, the work of a committee of Exeter University College and others. The different chapters vary in merit and completeness : Climate and Soil might be developed further, and the chapter on Physical Features is at once too geological and yet lacks an essential geological map. In the long chapter on fisheries we miss discussion of the waning of the pilchard fishery, and the reasons behind it and the effects on the population. It might also have been stressed that the soft, open climate gives more agricultural advantage than the soil in most parts of Cornwall. Population trends are well discussed, and it is a pity that much earlier conditions could not also have been considered. Lastly, we would have welcomed the inclusion of a separate study of the Isles of Scilly.

The book is full and accurate, and contains most of the raw materials for a regional survey of Devon and Cornwall ; its maps and diagrams are ingenious and good. R. N. R. B.

Rathlin Island. By Hugh Alexander Boyd. Foreword by Professor E. Estyn Evans, m.a., d.sc. 7½×5. Pp. 72. (*The Birds of Rathlin Island, County Antrim.* By Robert Patterson, m.b.o.u. Pp. 62-72.) 5 photographs. Map. Ballycastle, N.I. : J. S. Scarlett and Son, 1947. 3*s*.

Mr. Boyd's handy booklet on the topography and history, with a bibliography, of Rathlin Island, north of Antrim, is likely to add greatly to the interest of a visit. Mr. Patterson's list of the birds of the island is reprinted from *The Irish Naturalist* (1892) and forms a valuable appendix. C. J. R.

Directory of Iceland for the Year 1948. Editor : Hilmar Foss. 8×5½. Pp. 655. Reykjavík : Arbók Islands H.F. Twenty-fifth edition, 1947.

The Icelandic Parliament is the oldest legislative assembly in the world, and the Republic of Iceland, established in 1944, upholds a Constitution which secures for the inhabitants the various rights which a freedom-loving nation requires for its well-being. Iceland maintains a diplomatic and consular service, and at present there are Ministries of Justice and Ecclesiastical Affairs, Foreign Affairs, Education, Social Security, Finance, Trade, Commerce, and Communications. Health, education, and the arts and sciences as well as commerce are flourishing. An indication of Iceland's progress is the low death-rate, 10·1 per 1000, the average birth-rate being 24·7.

Information, including statistics, relating to the various aspects of the Republic is provided in the first half of the *Directory*. Originally compiled in 1907 by Mr. Sveinn Björnsson, now President of Iceland, the present edition of this well-produced year book, written in English, is also useful on account of the trade directory comprising its second half. The fact that the total population of Iceland approximates 132,800, less than that of Dunbartonshire, should provoke thought. J. H. K.

Swedish Life and Landscape. By Edric A. Hille. 8½×5½. Pp. 151. 91 illustrations. London : Paul Elek (Publishers) Ltd., 1947. 12*s* 6*d*.

This is a delightfully interesting little book on Sweden. The emphasis is on the people of that country, their customs and daily life and work. Superimposed on the different natural landscapes are the different human landscapes with the interrelationships quietly suggested. Both history and geography are shown to play their part in the human responses to the natural environment. The photographs are outstandingly good. J. Y. E.

On Rock and Ice : Mountaineering in Photographs. By André Roch. Foreword by Frank S. Smythe. 9¾×8¼. Pp. xv. 81 photographs. London : Adam and Charles Black Ltd., 1947. 21*s*.

Mr. Roch is a well-known and expert mountaineer and, in addition, is an expert photographer. In this publication, however, he has not only used his own photo-

graphs but also those of other experts in a series of photographs which covers a great part of the Alps and also illustrates many types of mountaineering technique and scenery. Quite a number depict spectacular rock climbs, while others are more scenic than technical, and the whole forms a delightful survey of the Alps.

The reproduction is good, and it is a book which mountaineers will turn to repeatedly. It will bring back memories of pleasant and exciting expeditions which they have made in the past, and will inspire others to make the acquaintance of the high Alps. A. H.

Switzerland : The Traveller's Illustrated Guide. 7×4¾. Pp. 259. 192 photographs. 24 five-colour maps. 16 panoramas. Sketch maps and town plans. London : Faber and Faber Ltd. Second English edition, 1947. 18*s*.

No better book could be provided for the general traveller than this English edition of a guide book which has gone through eighteen editions in Switzerland. It provides a comprehensive guide to all aspects of Switzerland likely to concern the traveller from " When to travel," to Customs Regulations, Transport Services, Hotels, Health Resorts, Sporting Facilities, and even a list of the new official place-names in Rhaeto-Romansch—St. Moritz, for instance, is now San Murezzan. There are 149 routes described in detail, with particulars of train and bus services, and 24 sectional maps covering the whole of Switzerland on a scale of 3⅛ miles to 1 inch. Mountain climbs are not included, probably on the ground that mountaineering requires its own guide books. The illustrations, though small—six to a page—are excellent. D. G. M.

A History of Portugal. By H. V. Livermore. 9×6. Pp. xvi+502. 13 plates. 7 maps. Cambridge : University Press, 1947. 36*s*.

This is primarily a political history, and as such well supplies a felt want in English. Economic and constitutional matters are dealt with. Cultural history is barely touched : the name Camões does not appear ; Gil Vicente is named only as the supposed artificer of the great gold monstrance at Belem.

For the geographer the main interest lies in the sections on exploration, discovery and colonial development intercalated amid the home history. The work of Henry the Navigator ; the voyages of Bartolomeo Diaz, Vasco da Gama, Cabral, and the rest ; the career of the great Albuquerque and other overseas administrators ; the rise and separation of Brazil ; the progress and present state of the modern colonial empire ; all these are given in terse, effective sketches, the salient points being brought out with admirable economy of words.

Noteworthy is a map of the world showing the tracks of the outstanding voyages, and past and present overseas possessions. There is a useful bibliography. Much miscellaneous information is conveyed in the " Reference Index," an encyclopedia of Portugal in brief. The comely format of the volume is in the high tradition of the Cambridge University Press. H. C. M.

Dust Upon the Sea. By W. E. Benyon-Tinker. 8¾×5⅝. Pp. 216. 56 illustrations. 2 sketch maps. London : Hodder and Stoughton Ltd., 1947. 15*s*.

This is an account of the exploits of the Levant Schooner Flotilla during 1943-44. The " schooners " were ex-Greek caïques, manned by a medley of naval and army personnel, and employed in raiding enemy-held islands. A modest style makes a very readable narrative. The illustrations are mainly of a personal character, but two good maps are provided. C. R. V. G.

Moscow : Sketches on the Russian Capital. Translated from the Russian by Peggy Cochrane. 8½×5½. Pp. 126. London : Hutchinson and Co. (Publishers) Ltd., n.d. 15*s*.

As one reads these sketches there rises in the mind the question : " Has Moscow —' The Third Rome '—a unique power of inspiring a form of hero-worship, or does the Russian find the full expression of his life as one of the community ? " There are ten authors, all Muscovite by origin or by adoption, but whatever the subject of the sketch—history, destruction, reconstruction, cultural or political

activity—an intense love of Moscow flows through them all, often expressed with an emotion which more sophisticated writers might try to hide. The sketches are too diverse in character to give anything like a complete picture of life or conditions in Moscow, but the subjective nature of the sketches give a revealing picture of the supreme significance of the idea of community in Russian life. S. C. F.

ASIA

The Island of Cyprus : An Illustrated Guide and Handbook. Compiled and edited by L. and H. A. MANGOIAN. Foreword by A. H. S. Megaw. 8¼×5½. Pp. xii+246. 205 illustrations. 9 sketch maps. Nicosia : Mangoian Brothers, 1947. 12*s* 6*d*.

Cyprus during past years was not seriously advertised and, being off the beaten track, was visited by comparatively few tourists. This new *Handbook* will fill a long-felt want and should materially help to bring to public notice the many attractions and historic importance of this beautiful island.

The publishers are to be congratulated on producing this interesting and comprehensive book of reference. It is packed with useful information on history, antiquities, agriculture, forestry, sport, etc. ; it is carefully compiled and indexed, and contains contributions by prominent residents in Cyprus, thus imparting information which is both reliable and concise. An outstanding attraction introduced by Messrs. Mangoian is the large number of excellent photographs and maps which illustrate many of the places referred to in the text. P. M. C.

The Cruel Way. By ELLA K. MAILLART. 8½×5½. Pp. 217. 74 illustrations. End-paper sketch maps. London and Toronto : William Heinemann Ltd., 1947. 18*s*.

The name of the author is a sufficient guarantee of something worth reading. But if the reader is expecting an account written in the same style and with the same absorbing interest as is found in *Forbidden Journey* or *Turkestan Solo*, he may find himself disappointed. *The Cruel Way* is an account of a journey by car, undertaken on the eve of war in 1939, from Switzerland to Afghanistan through South Eastern Europe, eastern Turkey, Azerbaijan and the Iranian plateau. The purpose of the journey would appear to be threefold : firstly, to escape from the insanity which held Europe in its grip in the summer of that year, and to reach some spot where a saner view of life and a more steadfast mode of living prevailed ; secondly, arising out of her desire for human stability, to study ethnology in the less accessible parts of Afghanistan ; thirdly, to try by undertaking this hazardous and strenuous journey to eradicate the drug habit to which her companion had become addicted.

This book is much more philosophical than her previous works, and at times one feels that one would rather hear more of actual happenings on the way than to accompany her every now and again into the realm of metaphysics. The account of the expedition is apt to be disjointed, though obviously much time has been spent on historical research on the many shrines and tombs which she visited *en route*. It might almost be said that the expedition has been used as a peg on which to hang historical snippets and introspective musings. Nevertheless, though these historical and philosophical—in places psychological—incursions irritatingly break the course of the journey's progress, when the tale is once more taken up there is the same vividness of portrayal which one has come to expect. But it is doubtful if one can acclaim this as a book of the same geographical importance as her previous ones. A. T. G.

Man-Eaters of Kumaon. By JIM CORBETT. Foreword by Lord Linlithgow. 8×5. Pp. xvii+212. 4 illustrations. End-paper sketch maps. London : Oxford University Press, 1946. 10*s* 6*d*.

Many villagers in the United Provinces owe their delivery from the presence of man-eating tigers to the skill and intrepidity of Major Corbett. In this book, which was first published in India in 1944, he recounts his experiences and records his careful and valuable observations of the habits of the tiger. His narrative will attract the general reader not less than it will the big-game hunter and the naturalist. J. H. K.

Persian Pictures. By GERTRUDE BELL. Preface by Professor A. J. Arberry. $8\frac{1}{2} \times 5\frac{1}{4}$. Pp. 157. London : Ernest Benn Ltd. Third edition, 1947. 10*s* 6*d*.

The name of Gertrude Bell has already joined in full equality those of her illustrious British predecessors, Claudius James Rich, Sir Henry Creswicke Rawlinson and others, who found their destiny in the land that is now Iraq. This book, an early promise of her later greatness, sets out in perfect word pictures the Persia of her visit in 1892. A classic of its kind, it will be read, or re-read, by all with enjoyment.

For an adequate appreciation of the author, the reader is referred to the preface to the present edition by Professor Arberry, and also to the detailed review of the second edition in the *S.G.M.*, 1928, Vol. 44, pp. 309-310. W. BR.

AFRICA

The Romance of Rhodesia. By ARDASER SORABJEE N. WADIA, M.A. $9\frac{3}{4} \times 7\frac{1}{2}$. Pp. xiv+146. 16 photographs. Sketch map. London : J. M. Dent and Sons Ltd., 1947. 21*s*.

What a wealth of memories Professor Wadia must have ! His one passion in life was to see the world, and to satisfy this he has sailed the Seven Seas, visited every continent, and seen their marvels in nature and the finest efforts of man. This latest book of his deals with a visit to Rhodesia, and the Romance he finds there is " the radiant romance of youth and knightly adventure with the promise of a glowing future." His main object was to see the Victoria Falls and the Zimbabwe ruins. As a Parsee, with a wide knowledge of Zoroastrianism and Persian architecture, he thoroughly disagrees with the theory advanced by Dr. Nazaroff that it was the work of a Persian colony who found their way to Central Africa at the beginning of the Christian era. The Elliptical Temple is not a Tower of Silence, and so far the mystery of its origin, Professor Wadia thinks, remains unsolved. Yet an attractive field of research remains open in ancient geographical names. He himself places Havilah in Southern Rhodesia and Ophir in Southern Arabia.

He writes interestingly of personages and things he found in Rhodesia. The book is beautifully printed and is enhanced by really artistic photographs by the author.

J. R.

Swartland and Sandveld : A Survey of Land Utilization and Soil Erosion in the Western Lowland of the Cape Province. By W. J. TALBOT. Preface by H. J. van Eck, Chairman of the Social and Economic Planning Council. $9\frac{1}{2} \times 7\frac{1}{4}$. Pp. xii+79. 59 figs. 7 plates. 2 maps. Cape Town : Geoffrey Cumberlege, Oxford University Press, 1947. 10*s* 6*d*.

To the good work done in recent years by geographers of the British Commonwealth in diagnosing, illustrating and prescribing remedies for soil erosion must now be added this account of man-made erosion in the western lowland of the Cape Province by Professor W. J. Talbot of the University of Cape Town. His report, which has been published under the auspices of the University, has been drawn up for the guidance of the Social and Economic Planning Council, 1944-45.

The area described includes low-lying land of two types—the Sandveld, nearest the coast, and of recent emergence from the sea, consisting of shallow-water deposits, beach materials and blown sand ; and the Swartland, lying inland, of earlier emergence, and therefore more modified by sub-aerial erosion. Wheat is the main crop grown.

Chapter I includes a general regional survey of the area, covering geomorphology, climate and the indigenous vegetation under natural conditions. Chapter II contains a particularly luminous account of the degenerative forces at work following misuse of the plough and destruction of soil structure. In more detail, the distribution of erosion types is dealt with in Chapter III, while suggested remedial measures form the subject of Chapter IV.

The illustrations are specially helpful. By skilful use of aerial photographs with superposed transparent relief maps the relationship of eroded areas to land forms can be seen at a glance. The diagrams are equally clear. The printing is excellent.

R. M. C.

AMERICA

Canada : A Study of Cool Continental Environments and their Effect on British and French Settlement. By GRIFFITH TAYLOR, D.SC., B.E., B.A. 8½×5½. Pp. xv+524. 161 figs. 8 photographs. End-paper map. London : Methuen and Co. Ltd., 1947. 25*s*.

Professor Griffith Taylor has written the volume for which geographers have been waiting since his appointment to the University of Toronto. The book is both regional and analytical, and is based largely on extensive travel in the Dominion. Its scope and content have made its chapters very crowded with factual information, but interpretations are never lacking and there is a great wealth of sketch maps and diagrams. Newfoundland and Labrador are included. The chapter on population problems, present and future, is particularly illuminating and forms a fitting conclusion to the book.

Canada, according to Griffith Taylor, lies mainly in what he calls the second best belt of the northern hemisphere—that is to say, poorer than the lands of France, United States and most of China, but with greater possibilities than Australia as a whole. The population figure, on European standard, will come eventually to 100 million on the higher standard of living on rich new lands, half that figure, compared with 500 million on the European standard for the United States or 250 million on the higher standard. The figures he gave for Australia were 60 and 30 millions.

R. N. R. B.

Canada Moves North. By RICHARD FINNIE. 8½×5½. Pp. 192. 65 illustrations. End-paper maps. London : Hurst and Blackett Ltd., 1947. 21*s*.

Probably this volume, originally published in New York and Toronto in 1942, is, as we are told on the dust cover, the only authoritative timely and popular book on the Northwest Territories as a whole. It certainly is packed with information, incident and criticism, and is a welcome corrective to the gloomy views so often expressed on the economic value of the Canadian tundra and Arctic islands.

Apart from the factual information, mainly unchanged since the original edition, Mr. Finnie has much to say about the blighting effect of civilisation on Eskimo and Indian. Canada is certainly looking after its native tribes to-day, but the harm is done and is irreparable. The Eskimo especially are mere dying remnants of a fine race. The chapter on exploration is the least satisfactory, and after all one can turn to other work for this matter. The end-paper maps are scarcely adequate, and the price of the book seems high.

R. N. R. B.

Link to the North. By G. J. TRANTER. 8×5½. Pp. 256. Frontispiece. End-paper sketch map. London : Hodder and Stoughton Ltd., 1946. 12*s* 6*d*.

Mr. Tranter, who, in *Plowing the Arctic*, told in popular form the story of the *St. Roch* [see *S.G.M.*, 61 (2) : 65], has again turned to real life for the theme of his new romance. In Micky Ryan, who opened up the road between Fort Fitzgerald and Fort Smith on the Mackenzie, and introduced horse transport to the far north, he has found a hero of the same calibre and leadership as Captain Henry Larsen. Ryan's life-story is an inspiring example of a man's struggles against climate, poverty, flood and fire, and loses nothing in the telling. The book throws many interesting sidelights on real characters in the Arctic and is a valuable contribution to the history of arctic transport from dog-sledge, horse-transport, and steamboat to airplane.

I. W. H.

Britain and the West Indies. By AGNES M. WHITSON, M.A., and LUCY FRANCES HORSFALL, PH.D. 7¼×5. Pp. 87. 17 illustrations. End-paper sketch maps. Pamphlets on the British Commonwealth, Second Series, No. 5. London : Longmans, Green and Co. Ltd., 1948. 1*s* 6*d*.

This is an overall summary of the history of the British West Indies, their peoples, their development, and British policies relating thereto. As a basis for a more detailed study of the West Indies this book should be of great assistance, and in any case should be read by all those whose knowledge of the British West Indies is vague and uninformed.

J. F. W. H.

The Rise of the Spanish American Empire. By SALVADOR DE MADARIAGA. $8\frac{1}{2}\times5\frac{1}{2}$. Pp. xx+408. 20 illustrations. End-paper maps. London: Hollis and Carter Ltd., 1947. 21*s.*

An objective apologia of the three hundred years which spanned the conquest and development of Spanish America, this book is not a chronological survey of the golden period in Spanish history but a reasoned treatise of cause and effect, of the imprint of great personalities, and, above all, of the over-riding anxiety of the Court of Castille for the welfare of the Indies.

Señor Madariaga has undoubtedly proved that Spain's activities *vis-à-vis* her Empire did not " tally with a Spain solely intent on pumping gold from the Indies." By political and economic standards that Empire failed. By all other standards—the grafting on to the American continent of European civilisation and life and of Europe's essentail democratic outlook, without sacrificing the native population—the Spanish American Empire compares most favourably with other Empires.

J. F. W. H.

BIOGEOGRAPHY

The Geography of the Flowering Plants. By RONALD GOOD, M.A. 10×6. Pp. 403. 71 figs. 16 photogravure plates. 9 maps. 295 references. London: Longmans, Green and Co. Ltd., 1947. 30*s.*

This is a most valuable book which should be of interest to geographers. It is divided into two parts, the first dealing with the distribution of families, genera and species. In this part are also included the history and distribution of the British flora and the distribution of plants in an English county (Dorset). The second part deals with the factors of distribution. There are many maps and illustrations which greatly add to the value of the book, and there is a good bibliography and a good index.

There is, of course, some divergence of opinion both in plant geography and plant distribution. Much of this difference is due to the difficulty of accurately assessing certain factors and which of many factors should be given priority in reaching a final decision. Professor Good has given a satisfactory assessment of the whole position. For those who may not agree there is the bibliography for consultation and references.

Assuming that the reader has some knowledge of botany, reading through Chapter 12 " The History and Distribution of the British Flora " and Chapter 13 " The Distribution of Plants in an English County," might serve as a general introduction to the more difficult matter of the rest of the book. Geographers should keep in mind that this book is written by a botanist for botanists, and that geographers and botanists—being human—do not always see problems from the same angle.

E. W. F.

The Grasslands of North America: Prolegomena to its History. By JAMES C. MALIN. $8\frac{1}{2}\times5\frac{1}{2}$. Pp. vii+398. Bibliography: pp. 336-397. Lithoprinted. Lawrence, Kansas: James C. Malin, 1947. $3.00.

" From one point of view the book may be considered as a series of essays on historiography, materials, and methods, together with sample case studies." This brief sentence from the introduction sums up the aim of the book. It is a book that should be of great value to geographers as it considers the various sciences involved in the grassland problem, with particular reference to ecology. This is very important, since the early pioneers and settlers did not understand why some areas were forest and others grassland. They exploited nature without regard to the ultimate consequences. It is only within recent years that the ecological background has been studied and its significance appreciated. Moreover, contrary to popular belief, these grasslands show great variation within the grassland type; a very significant fact for the farmer. Such features are most important and must be accurately assessed by those whose responsibility lies in the correct use of land. That is why much of the material in this book will be of considerable assistance to geographers. There is a very extensive bibliography covering every aspect of the subject.

E. W. F.

EDUCATIONAL

Industrial and Commercial Geography. By J. Russell Smith and M. Ogden Phillips. 9½×6. Pp. xv+978. Graphs, maps, and diagrams. 50 tables. New York : Henry Holt and Co. London : Constable and Co. Ltd. Third edition, 1947. 30*s.*

Reviewing the first edition of this work in 1914 in this *Magazine*, G. G. Chisholm described it as " the first book on the subject that has altogether abandoned the treatment of regional geography." The authors point out in the preface to the new edition that the method of presenting each of the great economic activities in its world setting facilitates comparisons between the various areas of production, with their differing natural conditions and ratios between men and resources.

A change in emphasis by the authors in this edition is indicated by their beginning their survey with power resources and dealing with metals and metal-fabricating industries before agriculture, which in the first edition was given the opening chapters. The greatest expansion is in the chapters on coal, iron and steel, copper, the place and nature of agriculture. In the latter part of the book a notable change is the replacement of the chapter entitled " The Law of Trade " by one with the more modest caption " Why do we trade ? ". The chapters on trade routes are almost unchanged, but a new chapter deals with the world's airways. There has also been considerable rewriting of the chapter on the trade centre.

In its new edition, in considerable part recast, half as large again as the original and with almost entirely new diagrams and tables, this remains a major text for students of economic geography. C. J. R.

Meteorology for All. By Irving Kohn. 8×5. Pp. vi+162. 68 figs. 8 photographs. New York : Barnes and Noble Inc., 1946. $2.00.

The bold title of this book is justified. It provides for the beginner an entertaining and, in the main, accurate introduction to meteorology, while the professional meteorologist, especially if he has had to teach his subject, will relish the ingenuity and gusto with which the author presents the more difficult concepts, usually avoided in a popular book of this kind. Just for this reason, the teacher will find it invaluable. The reader who is allergic to Americanisms will, of course, have to be prepared for a succession of shocks ; but is not this definition of convection intriguing ? " The heated material itself gets up and goes places, carrying the heat on its back. Instead of using matter merely as a thoroughfare, heat gives ' life ' to the material ; it makes it move." J. P.

Prelude to Geology. By H. H. Kent, m.a. 7¼×4¾. Pp. 120. 12 figs. London : Ernest Benn Ltd., 1947. 6*s.*

In his foreword the author states that his aim has been to provide " a brief, yet comprehensive, elementary survey of the geology of Britain—as introductory to deeper study—and to treat this rather tough subject in an easy vein." The author has succeeded. The book is brightly written, clearly illustrated and eminently suitable for the readers he has in mind. R. M. C.

Forestry. By H. L. Edlin, b.sc. 8½×5½. Pp. 48. 34 illustrations. Young Farmers' Club Booklet No. 20. London : Pilot Press Ltd., n.d. 1*s.*

This modest pamphlet is crammed full of useful information, though it is a little difficult to understand exactly what type of public it is intended to instruct. The text deals with the character of forest trees, their planting and care, felling and utilisation. The illustrations are excellent and the language simple. In a period of high-priced books, the low price of one shilling makes this brochure a really good investment. W. B.

The New Oxford Geographies. Book IV, Part 2. *The British Isles.* By Jasper H. Stembridge. 7½×5. Pp. viii+192. 82 figs. 12 plates. Four extracts from Ordnance Survey maps. Oxford : The Clarendon Press, 1947. 4*s* 6d.

This little book, written expressly for School Certificate purposes, comes from a well-known and accepted writer of school texts in Geography. In content, simplicity of language, and illustrations the book fulfils its purpose and will be readily accepted by teachers of the subject up to the stage indicated. J. Y. E.

The Story of Gibraltar. By H. W. Howes, M.A., M.Sc., Ph.D. Foreword by Lt.-General Sir Thomas Ralph Eastwood, K.C.B., D.S.O., M.C. 7½×5. Pp. 94. 16 plates. 2 sketch maps. London : Philip and Tacey Ltd., 1946. 4*s.*

For those leaving the Secondary Schools of Gibraltar the Director of Education has written a history of the outpost, relating it to European and British Empire history. There is a final chapter on Government—Central and Local, and a selected bibliography. This illustrated book is of interest to people who have served on " The Rock," but it would also be useful, for reference, in the school library.

J. H. K.

Soviet Land : The Country, its People, and their Work. By G. D. B. Gray. 8×6. Pp. viii+324. 141 figs. 85 photographs. London : Adam and Charles Black Ltd., 1947. 12*s* 6*d.*

This book, well printed on good paper, is not a discussion of the political importance of the U.S.S.R., but a serious and remarkably comprehensive study of the facts : the physical features and climate of the country, and the peoples that inhabit it, with a brief sketch of their history and very detailed account of their work and of the enormous re-organisation required to bring about the transformation that, despite initial handicaps and opposition at home and abroad, has been accomplished in the last thirty years.

The value and interest of the text is enhanced by numerous photographs, diagrams, and maps. The book is to be recommended to anyone really interested in the geography of Russia—Russia in Europe and Russia in Asia are treated as one—and ought certainly to be in the hands of all teachers of the subject. The publishers announce that a special school edition is available. R. T. C.

North America. By E. G. Ashton, M.A. 8×5. Pp. 394. 63 figs. 43 photographs. London : George G. Harrap and Co. Ltd. Revised and enlarged edition, 1947. 10*s* 6*d.*

This volume in Harrap's *New Geography Series* is intended for sixth form pupils going forward to the Higher School Certificate or to University Bursary Competition. For this purpose it is a most suitable text-book. The approach is in no way novel, but the subject-matter is sufficiently detailed and the geographical deductions are cogent enough to give confidence to the student attempting a question on North America. The maps and diagrams are fairly closely related to the text, though in some cases what they set out to illustrate is not quite sufficiently emphasised, usually because of the small scale on which the maps are drawn. The last chapter, on the history of European settlement and the knitting together of a heterogeneous collection of peoples into a fairly homogeneous mass, is well done. At the end is a useful statistical appendix as up-to-date as such appendices can be in these times.

A. T. G.

The Pacific Basin : A Human and Economic Geography. By Gordon L. Wood, M.A., Litt.D., and Patricia Ross McBride, M.A. 7½×5. Pp. xx+393. Frontispiece. 184 figs. Melbourne : Oxford University Press. Second edition, revised and enlarged, 1946. 12*s* 6*d.*

The authors of *The Pacific Basin* are on the teaching staff of Melbourne University, and for students in Australia and New Zealand this book should be most helpful. For us in Britain it is a volume that should have a place in the Geography section of the school library.

Most of our text-books tend to separate Asia and Australasia from the Americas. Here, as the title indicates, they are intimately linked, and it is this novelty which certainly makes the book so interesting. Teachers of Geography will find it most useful in providing a less usual approach to this part of the world. As they proceed to examine Malaysia, Australasia, the Pacific Islands, Eastern Asia and Western America, the authors succeed in covering a considerable part of the field of Geography as we understand it in the schools. The section on Australasia, as is to be expected, is for our purpose a most valuable one.

The pictures are well chosen, and the maps and diagrams mostly clear and uncrowded, while the bibliography at the end of each part should be of much help to a senior pupil making a study of a special region in the Pacific Basin. A. T. G.

GENERAL

The Use of Aerial Survey in Forestry and Agriculture. By J. W. B. Sisam. $9\frac{3}{4} \times 7\frac{1}{2}$. Pp. 59. 67 photographs. Imperial Agricultural Bureaux Joint Publication, No. 9. Oxford : Imperial Forestry Bureau ; Aberystwyth : Imperial Bureau of Pastures and Field Crops. Aberystwyth : Imperial Agricultural Bureaux, Central Sales Branch, 1947. 7*s* 6*d*.

While much has been written on the use of aerial photography in planimetric and topographic survey, no readily available account exists of its possibilities for providing qualitative and quantitative information on natural resources and land utilisation, and this in spite of the fact that it has been so used in many parts of the world, particularly the U.S.A., where it has been employed for forest classification and inventory, soil erosion, etc. Its potentialities for a rapid survey of colonial territories hitherto imperfectly known is obvious.

This little book sets forth, with copious documentation, the possibilities and practical application of aerial survey in forestry and agriculture, giving technical details far beyond the requirements of the geographer (*e.g.*, cost per square mile of survey, types of camera required, etc.) but of value to him in showing the difficulties and limitations of the work. The primary aim of the book seems to be to inform and advise forestry and agricultural authorities who may be contemplating embarking on an aerial survey project.

The excellent photographs add enormously to the value of the book, and are of the greatest interest in themselves quite apart from the text. R. M.

THE REVIVAL OF BRITISH GEOGRAPHY

At the Dundee Meeting of the British Association, 1947, Section E recommended the appointment of a committee of the Section to collect information on the revival of British geography from around 1880, and on the persons connected therewith. It was felt that, unless such steps were taken now, while some of the pioneers are still alive, a great opportunity of recording the most important phase in the history of British geography might be lost for ever. G. G. Chisholm, A. J. Herbertson, L. W. Lyde, H. J. Mackinder, Marion I. Newbigin, Ll. Rodwell Jones, P. M. Roxby—to mention only some—have all died, and of none is there an adequate appreciation in print so far or even a detailed statement of their services to geography. Many of the younger generation of geographers regard the task of collecting information as both a duty to posterity and a tribute to the pioneers.

Suggestions and contributions from any who may be interested should please be sent to the Secretary, T. W. Freeman, Department of Geography, Trinity College, Dublin.

VANS DUNLOP SCHOLARSHIP

The Vans Dunlop Scholarship in Geography (1948) has been awarded to Kenneth Walton, M.A., University of Edinburgh.

OGILVIE RANGE EXPEDITION, 1949

A Scottish expedition is being organised to explore the Ogilvie Range—named after William Ogilvie—in the Yukon Territory, between latitude 64° and 65° N. and longitude 131° and 135° W. The object of the expedition is to survey, photograph, and map the area, to ascend the principal mountains, and to make geological, botanical, and zoological observations and collections. Meteorological data are also to be recorded.

It is intended that the expedition should leave Britain in April 1949 and arrive at Mayo Landing in early May, in order to be in the Ogilvie Range area from mid-May until mid-September. The base camp is to be in the vicinity of a lake some 80 miles from Mayo Landing, the lake possibly being suitable as an alighting place for aircraft.

The expedition will be led by C. H. Pelham-Burn, Prestonfield House, Edinburgh 9.

SIXTEENTH INTERNATIONAL CONGRESS OF GEOGRAPHY

Owing to the small number of subscriptions and to other difficulties, the Organising Committee decided to postpone the Congress at Lisbon to April 8th-15th, 1949.

The excursions will start on Saturday, April 16th, and the excursion to Madeira, on April 23rd.

ROYAL SCOTTISH GEOGRAPHICAL SOCIETY

PROCEEDINGS

MEETINGS OF COUNCIL were held on 13th April, 8th June, and 27th July 1948, the President presiding.

Obituary.—Sir D'ARCY W. THOMPSON. See p. 65.

Awards.—The Scottish Universities Medal was awarded to Miss SHEILA MARY ELLIS, First Place, General Classes 1947-48, St. Andrews University; Miss ELIZABETH K. C. MARCHBANK, for distinguished work in the Junior Honours Class 1947-48, Glasgow University; JOHN MORLAND CRAIG, First Place, Ordinary Class 1947-48, Aberdeen University; ARCHIBALD MACPHERSON, First in Geography, First Course, 1947, and in Geography, Second Course, 1948, Edinburgh University.

ANNUAL GENERAL MEETING

The Annual General Meeting will be held in the Society's Rooms in Edinburgh on October 6th, 1948, at 4 p.m.

LECTURE SESSION, 1947-1948

Group-Captain FIELD delivered the lecture on "Air Photography in Peace and War" in place of Air Chief Marshal Sir PHILIP JOUBERT, on November 12th and 13th, 1947.

Major C. SPENCER COOKE lectured on "Socotra" on January 7th, 1948, in place of a lecture by Mr. Balfour Paul.

[Cf. *S.G.M.*, 1947, 63 (*2*) : 96 and 63 (*3*) : 160.]

LECTURE SESSION, 1948-1949

OCTOBER–DECEMBER 1948

EDINBURGH, *Usher Hall.*

EVENING MEETINGS, at 7.30 P.M.

October 7th. Sir JOHN FALCONER, W.S., LL.B., on "New Zealand." Illustrated. Sir John Falconer was Lord Provost of Edinburgh, 1944-47, and returned from a visit to New Zealand in July this year.

November 18th. Mrs. NORMAN HENRY, on "Beyond the Frontier in Northern British Columbia." Illustrated. Mrs. Henry, Director of the American Horticultural Society, is specially visiting Scotland to lecture at the Society's Centres.

December 16th. The Rt. Hon. The EARL OF WEMYSS, on "Basutoland." Illustrated. Lord Wemyss was in the Basutoland Administrative Service and Armed Forces, 1937-44.

Central Hall, Tollcross.

AFTERNOON MEETINGS.—Wednesdays, at 3 P.M.

October 13th. Miss ISOBEL W. HUTCHISON, F.R.S.G.S., on "The Danish Countryside." Illustrated.

October 27th. Lt.-Col. James Stevenson-Hamilton, F.R.G.S., on "The Kruger National Park." Illustrated.
November 10th. Dr. George A. Cumming, B.Sc., Ph.D., on "A Journey to the Rainbow Mountains of British Columbia." Illustrated.
December 8th. The Rev. Canon Norman J. Cockburn, B.D., on "Sweden To-day—Its Economy and Culture." Lantern Slides.

The Society's Rooms.

Geographical Papers.

A fourth series of meetings has been planned for the coming session and will take place monthly at 5 p.m. These meetings will normally include a discussion, and they are intended to provide a field not only for trained geographers but for thinkers in cognate subjects and for men of affairs who have a contribution to make to geographical thought.

The opening meeting, on October 22nd, at 5 p.m., will be addressed by Dr. E. Wyllie Fenton, on "An Outline of Vegetation Changes, with Human Implications."

Synod Hall.

Film Shows for Young People, at 10.30 a.m.

Fridays, December 24th and 31st.

GLASGOW, *Lyric Theatre*, at 7.30 p.m.

October 8th. Sir John Falconer, on "New Zealand." Illustrated.
November 17th. Mrs. Norman Henry, on "Beyond the Frontier in Northern British Columbia." Illustrated.
December 16th. The Rt. Hon. The Earl of Wemyss, on "Basutoland." Illustrated.

ABERDEEN, *Y.M.C.A. Hall*, at 7.30 p.m.

September 28th. Sir John Falconer, on "New Zealand." Illustrated.
November 16th. Mrs. Norman Henry, on "Beyond the Frontier in Northern British Columbia." Illustrated.
December 7th. James F. Anton, M.B.O.U., on "Bermuda—The World's Garden." Illustrated.

DUNDEE, *School of Economics Lecture Hall*, at 7.30 p.m.

October 6th. Dr. George A. Cumming, on "A Journey to the Rainbow Mountains of British Columbia." Illustrated.
November 10th. Mrs. Norman Henry, on "Beyond the Frontier in Northern British Columbia." Illustrated.
December 8th. James F. Anton, M.B.O.U., on "Bermuda—The World's Garden." Illustrated.

NOTICE

The growing demand, by libraries at home and overseas, for entire sets of *The Scottish Geographical Magazine* can be met only by the generosity of members who are able to spare their copies of issues now out of stock.

All bound volumes will be gratefully accepted, especially those from 1911 (Vol. 27) to the present day.

For the completion of sets, the following numbers are very urgently required :—

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It would be much appreciated if such copies of volumes and of separate numbers be handed without delay to the Secretary.